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(10) By: ROBERT S. GARNERO, JOHN C. BOBICK DAVID AYERS

Prepared for:

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DEPARTMENT OF THE NAVY
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This report describes an innovative and efficient outcome calculator to assist a task force commander in obtaining estimates for possible sequences of decisions and events related to air strike planning. The computational algorithm, input requirements, outputs, and man-machine interactions are described.

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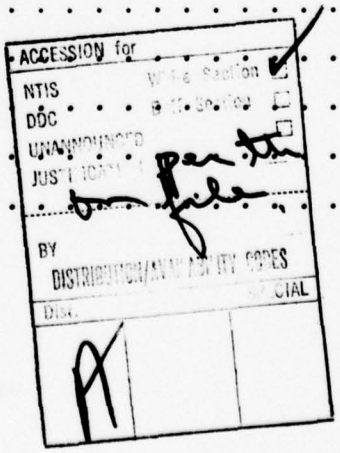

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I INTRODUCTION

A. Project Background

The Office of Naval Research (ONR) is currently pursuing a 5-year multicontractor program to promote the development of decision aids and procedures in support of fleet operations. The objective of the work is to improve tactical decisionmaking by blending a number of technologies such as decision-analysis, computer-driven graphic displays, advanced data management systems, information feedback, mathematical prediction, tactical models, and organizational analysis into a practical system for shipboard use. By concentrating on the needs and activities of the task force commander (TFC) and his staff, the project emphasizes decision aids that rely on the judgments of senior officers experienced in operational situations, rather than on the predictions of system designers. These aids will provide guidelines and tools to structure decision problems, elicite judgments of probabilities and outcome preferences, furnish stored data and models requested by the decision maker, make statistical inferences, and display and/or print the implications of trial tactics before their execution. All of these objectives are compatible with ongoing command-control hardware programs. Decision makers will thus be provided with a man-computer interactive capability to help them examine and evaluate alternative courses of action.

The Naval Warfare Research Center (NWRC) of SRI International (formerly Stanford Research Institute) has been a continuing participant in the program under Contract N00014-75-C-0742. NWRC has evaluated and produced a specific task force decision-aiding procedure called the Strike Outcome Calculator (SOC). SOC, which is an automated decision aid for use

in estimating outcomes associated with naval air strikes, is described here in detail to allow its employment by decision makers. For further background on SOC, refer to the following two documents produced by NWRC: "Augmentation of the Naval Task Force Decision-Aiding System: The Outcome Calculator" (April 1977) and "Evolution and Preliminary Tests of the Strike Outcome Calculator" (March 1978).

B. SOC Concept

SOC is a decision aid that enables a user quickly and easily to estimate battle outcomes associated with alternative courses of action (COA). SOC consists not only of a computational algorithm, but of an interactive medium to facilitate both the description of alternative COAs and the display of the associated battle outcomes. A decision aid like SOC may prove useful in decisions concerned with long-range planning, contingency planning, and short-range tactical execution. SOC is tailor-made for use as a component of a naval task force decision-aiding system. In addition to this role, SOC is, in its own right, a decision aid and can be used independently of any structured decision problem solving system.

The SOC concept is illustrated in Figure 1. As the figure indicates, the major parameters that enter into the choice among alternative COAs are timing, use of assets, force position, threat action, and weather. Combinations of parameters can produce several alternatives, which are sometimes represented as branches of a "decision tree." SOC evaluates outcomes associated with such branches. A user generally describes a possible COA by prescribing values of these parameters in aggregate, often qualitative, terms. SOC then allows the user to easily describe alternative COAs over a wide range of values of associated parameters, and yet maintain a level of detail consistent with his needs.

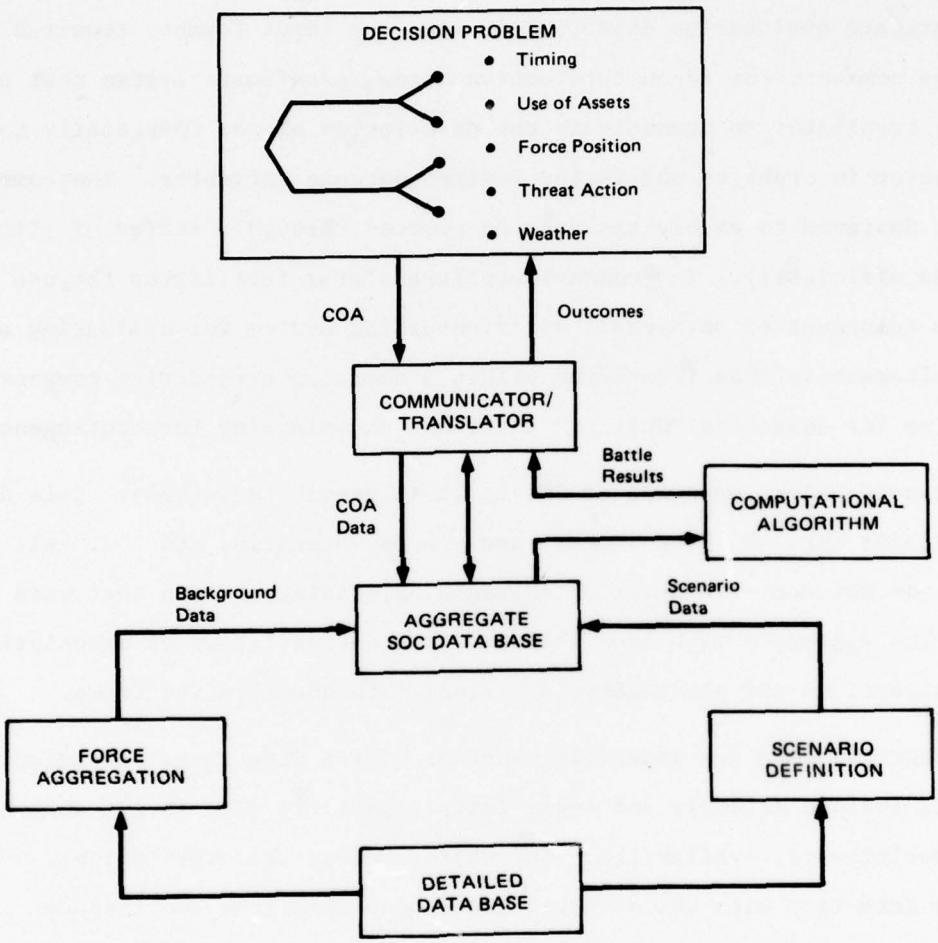

FIGURE 1. SOC CONCEPT

As shown in Figure 1, the SOC system contains three major components: the communicator/translator, the aggregate SOC data base, and the computational algorithm. The communicator/translator is the man-machine interface between the decision-maker and the computational algorithm and data base. The translator is sufficiently familiar with the decision problem to translate aggregate qualitative descriptions into the input formats required by SOC. The communicator is an interactive hardware/software system that permits the translator to communicate the description of the COAs easily to the computer in order to obtain the desired outcome estimates. The communicator has been designed to enable the user to proceed through a series of alternative COAs efficiently. The communicator/translator facilitates the use of SOC as a component of an overall decision-aiding system for evaluating a set of alternative COAs identified within a decision structuring component as well as for answering "what if" questions and planning for contingencies.

A second major component of SOC is the aggregate data base. This data base contains data of three types: background, scenario, and COA. All data in the SOC are at a level of aggregation consistent with that used by a TFC. The aggregate data base facilitates the translation of descriptions of the situations and alternative decisions into quantitative terms.

Background data are generally constant over a wide range of scenarios. Such data include friendly and enemy force capability data (e.g., weapon system performance, availability, and effectiveness characteristics). Scenario data vary with the scenario under consideration, and include friendly and enemy resources, force concentration, and environment. COA data include the timing, use of assets, force position, and threat action data that describe a particular COA.

Background data are generated by manual aggregation of the detailed weapon system performance and operations data to the level required by SOC. Similarly, developing scenario data involves manual procedures in

which more detailed operational and intelligence data are used to obtain the aggregate data for SOC.

In general, background and scenario data will have been loaded previously into the aggregate SOC data base. For various decision problems, the user provides COA data by means of the communicator/translator and receives outcome estimates. The battle results are generated by the computational algorithm from the current background, scenario, and COA data in the data base. A series of alternatives are investigated by modifying the COA data to move from one alternative to another. The communicator provides the user with direct access to all the data in the aggregate data base and allows him to display and modify all data.

The computational algorithm uses the data in the aggregate data base for straightforward computation of battle results. The relative simplicity of the algorithm, which enables interested users to understand the number-generating routines, does not imply a lack of credibility. The algorithm is consistent with the level of detail of the data, and therefore the integrity of the overall system is maintained. In fact, the absence of internal assumptions, which are common in more detailed algorithms, enhances the credibility of the SOC algorithm. In essence, the SOC computational algorithm provides a consistent, understandable, automated means of transforming a COA, as described by the user in terms of the data, into the implications of the action in terms of attrition and battle accomplishment results.

The data are structured to permit model credibility without overburdening detail. In most battle simulations, as the inputs become more numerous or detailed (with a resulting increase in model sophistication), the user cannot rapidly and easily see the underlying numerical routines; this reduces his ability to relate the casual effects of the input to the output. The aggregated data of SOC allow the user to avoid lack of

confidence associated with more detailed data inputs that are characterized by hidden and inflexible assumptions, doctrines, and numerical techniques within the model. Additionally, with SOC users can employ their judgement and experience as necessary or desired.

C. Document Purpose and Organization

This document provides the information required to exercise SOC methodology properly. Because the audience for this volume is comprised of naval decision makers, users are assumed to understand relevant Navy systems, procedures, and terminology. Use of this document does not require a technical data processing background. However, a general knowledge of the basic principles of data processing will aid the user.

The document sets forth computer hardware and software requirements (Section I D) necessary to exercise the SOC and also states the input data requirements (Section II B). These requirements appear early in the document to help explain the computational algorithm used within SOC (Section III). The inputs are stated in conjunction with sample data generated from the problem scenario in Appendix A. Section II on SOC data closes with an interpretation of the generated output.

Later sections detail the major subroutines used within the SOC and describe the systems man-machine capabilities. Appendix B shows the SOC program listing.

D. Computer Hardware and Software Requirements

SOC is currently configured for a PDP-10 computer and uses the time-sharing, interactive capability of that system. It requires 35,000 words of core storage and is written primarily in the FORTRAN and MACRO (assembly) languages. Each MACRO routine has a single purpose and is called up via FORTRAN to perform a single function, primarily in the area of character manipulation and terminal (CRT) input/output (I/O).

SOC requires a CRT nonstorage screen with the following functions:

- Character-for-character transmission
- Erase screen via line
- Cursor movement via line
- Blink on/off via line (optional).

During the display and editing performed by SOC, the terminal needs to achieve an uninterrupted nonechoed character I/O. In some systems this is called BINARY or TRANSPARENT MODE. SOC is now programmed to handle two terminals, the DATAMEDIA 1520 and 2500, but can be expanded to accommodate more terminals with minor modifications. These modifications involve changes in the INIT, NWSCRN, PTBLC, and PTUBLC subroutines. A line speed of at least 2400 baud is recommended to enhance SOC interaction.

To use SOC, the program will have to be compiled and readied for execution by the time-share user. A support file known as FORMS is required and must be installed on a direct-access device during program execution. The program reads this file (composed of SOC computer table formats) throughout the program execution.

II SOC DATA

A. Introduction

The SOC data base is organized into 19 internally stored computer tables. The first 14 are used by the decision maker to input parameters into the SOC computational algorithm and the last 5 are used to receive the associated results. The computer table titles are listed in Table 1. (To avoid confusion with other tables in this report, the computer tables discussed herein are portrayed as "exhibits.")

Table 1

SOC COMPUTER TABLES

Computer Table	Title	Type
1	Blue and Red Force Elements	
2	Blue Force Units	Background data
3	Red Force Units	
4	Engagement Statistics, Blue Attacking Red	
5	Engagement Statistics, Red Attacking Blue	
6	Weapon Platform Availability	
7	Operations and Damage Repair Capabilities	
8	Blue Force Complexes	Scenario data
9	Red Force Complexes	
10	Miscellaneous Inputs	
11	Blue Operations Plans	COA data
12	Red Operations Plans	
13	Relative Force Positions	
14	Weather Days	
15	Blue Mission Accomplishment Results	Results (computed outcomes)
16	Red Mission Accomplishment Results	
17	Blue Battle Attrition Results	
18	Red Battle Attrition Results	
19	Aircraft Expenditure Summary	

This document examines the contents of each computer table, by looking first at the input computer tables and their associated three types of data: background, scenario, and COA. Their explanation is geared to an example from the ONRODA problem scenario in Appendix A. Examination of that scenario will aid the reader as he studies the input data examples that are shown. When applicable, suggestions are given to the user about how he might generate particular data elements. The physical entry of the data elements is presented in Section IV, SOC Man-Machine Interactions. Shaded areas of the exhibits indicate areas in the computer tables the user is not expected to, and, indeed, cannot change.

B. Input

1. Background Data

Blue and Red Force Elements--In the SOC concept, the friendly (Blue) and enemy (Red) forces are assumed to be composed of generic force elements. Exhibit 1 shows the setup for the Blue force elements and the Red force elements. Blue forces may be composed of any subset of the following six generic force elements: attack aircraft (ATTACK), all-weather attack aircraft (AW-ATTACK), low performance fighter (VF-LO), high performance fighter (VF-HI), Carrier (CV), and support ship. Red forces are composed of eight generic elements: low-performance attack aircraft (BOMBER-LO), high-performance attack aircraft (BOMBER-HI), fighter-bomber (VBF), interceptor fighter (VFI), surface-to-surface missile (SSM-SHIP), airbase, surface-to-missile site (SAM-SITE), and supply line.

The generic elements that are to make up the forces appear in the first column and cannot be changed. The second column contains user designators as desired. These designators indicate the implicit implications of the following input computer tables. Performance and operational data, input subsequently for each element of those tables, will be representative

EXHIBIT 1

BLUE FORCE ELEMENTS

ELEMENT	EXAMPLE	CLASS
ATTACK	A-7E	OA
AW-ATTACK	A-6E	OA
VF-LO	F-4J	DA
VF-HI	F-14A	DA
CV	KITTY HAWK	OS
SUPPORT SHIP	DLG LEAHY	DS

RED FORCE ELEMENTS

ELEMENT	EXAMPLE	CLASS
BOMBER-LO	BADGER A	OA
BOMBER-HI	BADGER C	OA
VBF	SU-7B	OA
VFI	MIG-21	DA
SSM-SHIP	SS-N-3	OS
AIRBASE	ONRODA	OS
SAM SITE	SAM-3	DS
SUPPLY LINE	AAA	LS

OA-OFFENSIVE AIR
DA-DEFENSIVE AIR
OS-OFFENSIVE SURFACE
DS-DEFENSIVE SURFACE
LS-LOGISTICS SUPPORT

of the weapon system specified. Each generic element is also given a class designation: offensive air (OA), defensive air (DA), offensive surface (OS), defensive surface (DS), and logistics support (LS).

Blue and Red Force Units--In performing offensive or defensive missions, certain combinations of the force elements are used in SOC. The user can define a variety of force units by specifying that units be composed of combinations of the elements specified in computer table 1, which is shown in Exhibit 1.

Exhibit 2 shows a sample definition of Blue force units. VFCAP, SUCAP, and DLI are SOC-defined reserved words. Any unit to be used as a fighter combat air patrol must be labeled as type VFCAP; any unit to serve as a surface combat air patrol must be labeled as type SUCAP; and any unit used as a deck launch interceptor must be labeled as type DLI. All other units may be designated by any type name the user desires. Several different force units within a given type may be defined by designating unit subtypes. Every unit must be defined by a type designation. However, it is not necessary for each unit type to be further delineated by subtype. Two different units may have the same elements in their makeup if the user intends to use the units differently during the battle (i.e., the same aircraft flying different tactics in various weather conditions with varying weapon loads can have different associated engagement statistics).

For each Blue unit defined, the numbers of attack, all-weather attack, low and high performance fighters, and suppression aircraft* must be specified. All-weather attack aircraft are used for suppression. In addition, several characteristics must be assigned to each unit, including: the maximum range of the unit (LONG or SHORT); the long-range default force unit (i.e., the force unit subtype to replace it if its maximum range

*Suppression aircraft are assumed to be specially configured, all-weather attack aircraft.

EXHIBIT 2

BLUE FORCE UNITS												
B FRC UNIT		ELEMENTS PER UNIT					UNIT CHARACTERISTICS					
TYPE	SUB	VA	AW	VF LO	VF HI	SUP A/C	MAX RANGE	RANGE DEF --SUB-	WORST WX	WX DEF -SUB-	MAX DET (NM)	SPEED (MACH)
ALPHA-	A	3			1	1	LONG		GOOD	C	100	.9
ALPHA-	B	3			1	1	LONG		GOOD	C	100	.9
ALPHA-	C		2		1		LONG		BAD		100	.9
ESCOR-	A				1		LONG		GOOD	C	100	.9
ESCOR-	C				1		LONG		BAD		100	.9
SUCAP-		1	1				LONG		BAD		100	.9
VFCAP-					1		SHORT		BAD		100	2.2
DLI -					1		SHORT		BAD		100	2.2
-												
-												
-												
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-												

EXHIBIT 3

RED FORCE UNITS												
R FRC UNIT		ELEMENTS PER UNIT					UNIT CHARACTERISTICS					
TYPE	SUB	BR LO	BR HI	VBF	VFI	SSM SHP	MAX RANGE	RANGE DEF --SUB-	WORST WX	WX DEF -SUB-	MAX DET (NM)	SPEED (MACH)
FREE -	A	4		4			LONG		GOOD	B	300	.9
FREE -	B	4					LONG		BAD		300	.9
VBF -	A			8			LONG		GOOD		300	.9
SSM -						1	SHORT		GOOD		200	.9
SLI -					1		SHORT		BAD			1.5
-												
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is "SHORT" and it is assigned a long-range mission); the worst weather conditions (GOOD or BAD) in which it can perform; the bad weather default unit (i.e., the force unit subtype to replace it if the worst weather condition in which it can perform is GOOD and it is assigned a mission in BAD weather), maximum range (miles) at which it can be detected by the enemy; and the speed (mach) at which the unit operates. The default units differ only in subtype from the original unit. No default unit need be specified. If no range is specified, LONG is assumed. If no worst weather is specified, BAD is assumed.

Exhibit 3 shows a sample definition of Red force units. SLI and SSM are SOC defined words reserved for Red forces. Thus, any Red unit that is to operate as a strip launched interceptor must be specified as type SLI, and any unit used to similate SSM attack must be specified as type SSM. The rest of computer table 3 is filled in using the same rules described in relation to computer table 2.

To arrive at the unit definitions, listing the capability of the elements is helpful, as is analyzing their employment (sortie rates). The degree of effort required to arrive at the unit definition and the composition of the unit must be a judgment of the TFC and his staff. These judgments for the most part are influenced by the defensive strength of the threat (e.g., SAMs and interceptors) and the planned duration, in days, of the friendly strikes.

With regard to Blue, if the target is heavily defended with enemy SAM batteries and interceptor aircraft, then the Blue support elements (VF and AW) could be strengthened at the expense of increased sortie rates or weakening the task force defense. Alpha A in Exhibit 2 is an example of this stronger unit:

3 attack 1 AW attack 1 VF

A weather contingency is also provided by establishing the Alpha C unit of 2 AW attack aircraft and 1 VF.

As many as 15 units can be described for each of the Blue and Red forces.

Engagement Statistics--Having defined the force units, the battle engagement statistics that provide the basis for determining Blue and Red losses in combat must be specified. The engagement statistics for Blue attacking Red are shown in Exhibit 4, and for Red attacking Blue in Exhibit 5. As these exhibits indicate, engagement statistics are fairly aggregate measures of the battle effectiveness of the force units previously defined. These measures include the number of attacking force units that can be killed by air-to-air and surface-to-air means per defensive element of the force under attack. A second set of statistics gives the number of the defending fighters that can be killed air-to-air per unit of attacking force. The third set of statistics gives the number of the defending force elements that can be killed surface-to-air per unit of attacking force that penetrates the defenses.

In specifying the effectiveness of an attacking force unit, the synergistic effects of the various assets in the unit (e.g., attack, fighter, and suppression aircraft) should be considered. The importance of such synergistic effects as well as the application of user judgment were primary factors in the decision to treat force assets in terms of units.

It is unnecessary for units appearing in computer tables 2 or 3 to also appear in computer tables 4 or 5; however, any unit that is specified for use in its respective operations table (computer tables 11 and 12) must appear in both the unit definition computer table and engagement statistics computer table.

EXHIBIT 4

ENGAGEMENT STATISTICS FOR BLUE ATTACKING RED

BLUE FORCE UNIT		BLUE UNITS LOST PER RED DEF ELEMENT				MAX RED AIR LOST PER BLUE UNIT		RED SURFACE ELEMENTS LOST PER BLUE UNIT				
TYPE	SUB	VBF	VFI	SAM	SPLY LINE	VBF	VFI	PKED A/C	SSM SHIP	AIR BASE	SAM	SPLY LINE
ALPHA-	A	.07	.125	.052		8	6.7	2.7			.9	
ALPHA-	B	.07	.125	.052		8	6.7	5.4			.9	
ALPHA-	C	.04	.08	.004		6	2.67	.8				
ESCOR-	A	.1	.25			4	4.					
ESCOR-	C	.05	.12			2	2.					
SUCAP-		.5	.5	.006		2	1.3		.6			
-												
-												
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EXHIBIT 5

ENGAGEMENT STATISTICS FOR RED ATTACKING BLUE

RED FORCE UNIT		RED UNITS LOST PER BLUE DEF ELEMENT				MAX BLUE AIR LOST PER RED UNIT		BLUE SURFACE ELEMENTS LOST PER RED UNIT		
TYPE	SUB	VF LO	VF HI	CV	SUP SHIP	VF LO	VF HI	PARKED A/C	CV	SUPPORT SHIPS
FREE -	A	.22	.5		.37	4	1		.2	.5
FREE -	B	.62	1.		.75					.5
VBF -	A	.12	.5	.12	.37	8	1	2		.2
SSM -		.19	.37	.19	.28				.2	
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Data that can be utilized to support the input elements of computer tables 4 and 5 include air-to-air exchange ratios, SAM effectiveness data, and air-to-surface effectiveness data. Examples of this type of data are illustrated in Table 2.

The data in Table 2 can be used with some simple computations to fill in parts of Exhibit 4. Air-to-air data are used in the VBF/VFI columns, SAM data in the SAM and SUPPLY LINE columns, and air-to-surface data in the surface effects columns. The following numerical examples use the data presented in Table 2 to manually yield the first row of entries in Exhibit 4.

AIR TO AIR

It will take 14 Red VBF to kill 1 Alpha A unit as follows:

10 VBF to 1 VF-HI
4 VBF to 4 VA
14 VBF to 1 unit

Therefore, the Blue loss to 1 VBF is said to be 1/14 = 0.07 unit.

It will take 8 Red VFI to kill 1 Alpha A unit as follows:

4 VFI to 1 VF-HI
4 VFI to 4 VA
8 VFI to 1 unit

Therefore, the Blue loss to 1 VFI is said to be 1/8 = 0.125 unit.

Maximum Red air losses per Blue unit:

1 VF-HI kills 4 VBF
4 VA kill 4 VBF
1 unit kills 8 VBF

Table 2

SAMPLE ENGAGEMENT DATA BASE

1. Air-to-Air Exchange Ratio

	MIG-21	MIG-19/SU-7	BADGER	SSM
F-14	1/4	1/10	0/4	0/3
A-7 or A-6	1/.67	1/1	0/1	NA

These kills must be limited by the armaments that are usually carried. Maximum kills per aircraft are:

F-14--4 MIG-21--1

A7/A6--1 SU-7--1/2

2. SAM Effectiveness

These data can be taken from historical attrition figures.

Losses per 1000 Sorties

	AIRFIELD ATTACK	WAR AT SEA	CAS/ARREC
A-7	15	3	5
A-6	7	3	3

3. Air-to-Surface

These data can be taken from China Lake studies or Joint Munitions Effectiveness Manual (JMEM) and will depend on weapons carried, altitude released, number of passes, mil accuracy of aircraft, weapon P_k, and type of target.

An example would be an A-7 loaded with laser-guided bombs. This scores a 0.9 P_k against an enemy aircraft on the ground. Therefore 3 A-7s in a unit may be said to "kill" 2.7 enemy aircraft on the ground.

1 VF-HI kills 4 VFI

4 VA kill 2.7 VFI

1 unit kills 6.7 VFI*

SAM EFFECTIVENESS

Blue unit Alpha A

3 VA sorties lose $\frac{3 \times 15}{1000}$ = 0.045

1 AW sortie lose $\frac{1 \times 7}{1000}$ = 0.007

Blue units lost to SAM = 0.052
(Blue VF-HI are not engaged)

AIR-TO-SURFACE

Blue Unit Alpha (VF-HI do not attack ground targets.)

3 VA attack Red aircraft on ground
(with 2 LGB (P_k = 0.9))

Red kills = 3 x 0.9 = 2.7

1 A6 attack SAM batteries (site radar)
(with Standard ARM) P_k = 0.9

Red SAM site kill = 1 x 0.9 = 0.9

The data for computer table 5 are manually computed in a similar manner. Badger and VBF bomb loads and CEPs must be estimated to give probable damage to the Blue CV and support ships. Probable damage must also be estimated for the SSM attack. The Blue VFCAP, DLI, and Blue SAM ships will operate on the defensive to kill those attackers.

Weapon Platform Availability--The next type of background data required is weapon platform availability statistics. The form for these

---

*During an engagement, weighted averages of the two maximums are computed, based on the defensive force composition.

data is shown in Exhibit 6. For each of the force elements, normal and surge sortie rates and a refuel-rearm time must be specified. The normal sortie rate for a weapon platform is the average number of sorties that can be mounted per day on a sistained basis (usually 30 days). The surge sortie rate is the maximum number of sorties that can be mounted in a 24-hour period. The refuel-rearm time is the minimum time before a weapon platform returning from a mission can be ready to depart on another mission. In the computational algorithm, the battle is simulated in 3-hour increments. Thus, the refuel-rearm time is specified in terms of the number of 3-hour time periods. If a refuel-rearm time of zero is specified for an element, that element can return from one mission at the beginning of a time period and leave on another mission in the same time period.

Capabilities of Aircraft-Related Elements--The last of the background data are the operations and damage repair capabilities of the Blue carrier and Red airbase elements. The form of these data is shown in Exhibit 7. For various damage levels, the maximum number of operations per 3-hour period and the maximum damage repair capability per period must be specified for each element of Blue CV and Red airbase.

In determining the maximum number of operations for an undamaged Blue carrier, the sortie rate times the total number of aircraft aboard is often used as the index of carrier operational capability. The question of whether to use a surge rate or a sustained rate should be considered; it may depend on the estimate of the length of the operation (or war). A sustained rate could be used for campaigns of one or more months, but a surge rate is particularly appropriate for use in analyses involving time-sensitive targets such as the ONRODA scenario. Damage parameters can be developed with the kind of data found in the David Taylor Model Basin Technical Note SML-740-37, "The Operational Capabilities of a Forrestal-Class Aircraft Carrier After Successful Missile Hits," F. Weinberger

EXHIBIT 6

WEAPON PLATFORM AVAILABILITY			
FORCE ELEMENT	NORMAL SR	SURGE SR	R/R TIME
VA	1	2	1
AW	1	2	1
VF LO	1	2	1
VF HI	1	2	1
BR LO	1	1.5	1
BR HI	1	2	1
VBF	1	2	1
VFI	1	2	1
SSMSHIP	1	2	4

EXHIBIT 7

CAPABILITIES OF A/C RELATED ELEMENTS				
	MAX OPERATIONS PER PERIOD		MAX DMGE REPAIR PER PERIOD	
DAMAGE LEVEL	BLUE-CV	RED-AIRBASE	BLUE-CV	RED-AIRBASE
0.0	250	300	0	0
0.1	225	260	.07	.07
0.2	200	230	.12	.12
0.3	125	200	.15	.15
0.4	100	175	.16	.16
0.5	75	150	.15	.15
0.6	24	24	.12	.12
0.7	24	24	.07	.07
0.8	0	0	0	0
0.9	0	0	0	0
1.0	0	0	0	0

and R. Santa Maria (March 1965). However, the numbers used for computer table 7 shown in Exhibit 7 for "MAX DAMAGE REPAIR PER PERIOD" could be the TFC's estimates of the capability of his damage control units aboard a specific carrier. That is, for 20% damage to a carrier the repair crews might repair 12/20 of the damage in a 3 hour period.

This concludes the background data inputs. These data are generally derived by aggregating more detailed data found in Navy data bases and publications. As indicated in the description above, these data are fairly static, depending on the weapon systems and operating doctrine involved.

2. Scenario Data

Force Complexes--A concept employed in defining scenario data is that of force complexes. Force complexes are groupings of Blue or Red force elements. Each force can have as many as 8 complexes. The forms for the data used to define complexes are shown in Exhibits 8 and 9. As seen from these exhibits, a complex is defined by specifying the numbers of the various force elements associated with it, and the resources for the defense of a complex are assumed to be drawn from these elements. Similarly, resources for offensive actions are assumed to be drawn from the elements of a particular complex, with another complex being the target of the action. Complexes are defined as collections of elements, which are defined in computer table 1. Units are composed of collections of elements taken from the complexes they operate from. For all Blue complexes with aviation assets, including land bases, at least one unit of CV must be specified to guarantee operational capabilities as noted in computer table 7. Conversely, all Red complexes having aviation assets, including ships, must have at least one unit of air base.

EXHIBIT 8

BLUE FORCE COMPLEXES

	ELEMENTS						CHARACTERISTICS					
BLUE COMPLEX	VA	AW	VF LO	VF HI	CV	SUP SHIPS	DLI LNCH TIME (MIN)	SURV RANGE FACT	FRACT A/C SHELT	CYCL TIME DAYS	REPL TIME DAYS	REPL OPS
CTFRC -	48	24	0	48	2	12	.5	1	.3	4	1	50
-												
-												
-												
-												
-												
-												
-												

EXHIBIT 9

RED FORCE COMPLEXES

	ELEMENTS								CHARACTERISTICS					
RED COMPLEX	BR LO	BR HI	VBF	VFI	SSM SHP	AIR BSE	SAM STE	SLY LNE	DLI LNCH TIME (MIN)	SURV RANGE FACT	FRACT A/C SHELT	CYCL TIME DAYS	REPL TIME DAYS	REPL OPS
ONRAF -	24	0	72	72		1	19	0	.5	1	0	6	2	50
ORGAF -	36	0	72	72		1	27	0	.5	1	.3	6	1	50
REDCA -					1					1	0	4	1	
-														
-														
-														
-														
-														

In addition to physical location, one may define more than one Blue or Red complex for a number of reasons. For example, Red and Blue forces may be composed of several allies who act independently, or several groups of force elements may initiate or be the targets of attacks independently of each other. For illustration, assume that Red and Orange are allies, as is the case of the problem scenario, with Orange having airbases on the island (ONRODA) and on the mainland. These two airbases may be called ONRAF and ORGAF. Suppose further that Red has a surface missile ship in the area. This ship can be designated as a third Red complex, REDCA. If Blue is operating a carrier task force against Orange, it might be designated as a Blue complex called CTFRC.

In addition to numbers of elements at a complex, several characteristics must be specified. For Blue complexes the time (minutes) between successive DLI launches must be given. For Red complexes the time (minutes) between successive SLI launches must be given. The surveillance range factor, which multiplies the maximum detection range of incoming enemy force units against the complex, must be given. This factor is meant to reflect individual complex surveillance capabilities. For example, in Exhibit 2 the maximum detection range for ALPHA A unit is given as 100 nmi, while in Exhibit 9 the surveillance range factor for ONRAF is given as 1. This means that all ALPHA A units attacking ONRAF will be detected at 100 nmi. The number of sheltered aircraft assigned to each complex must be specified. Sheltered aircraft are not subject to air-to-surface attrition by enemy raids. If a complex, such as a carrier, operates in a replenishment cycle, the length of the cycle is specified, in days as well as the number of days of the cycle during which replenishment is conducted. The maximum percentage of normal operations that can be conducted during replenishment is also specified. Operations during replenishment can be restricted to defensive operations only, by including a "D" after the percentage of normal operations.

EXHIBIT 10

MISCELLANEOUS INPUTS	
MAXIMUM NUMBER OF DAYS THE BATTLE IS TO RUN(LESS THAN 11)	10
MISSION TIME FOR LONG RANGE MISSIONS(NO. OF 3HR TIME STEPS)	0
MISSION TIME FOR SHORT RANGE MISSIONS(NO. OF 3HR TIME STEPS)	0
NO.OF OPERATIONS PER AIRCRAFT LANDING	2
NO.OF OPERATIONS PER AIRCRAFT LAUNCH	1
FRACTION OF MAX UNIT DETECTION RANGE REALIZED IN BAD WEATHER	.5
DELAY IN MINUTES BEFORE FIRST SLI/DLI CAN BE LAUNCHED	3
DO YOU WANT LONG RANGE FORCE UNIT DEFAULT IN EFFECT(1=YES,0=NO)	1
DO YOU WANT BAD WEATHER FORCE UNIT DEFAULT IN EFFECT(1=YES,0=NO)	1
STOP BTLE WHEN ALL MISSIONS COMPLETE(ELSE OFFENSE ONLY)(1=Y,0=N)	0

Miscellaneous Input--In addition to the complex definitions, scenario data include several miscellaneous inputs. These inputs, which are shown in Exhibit 10 are fairly self-explanatory. A mission time of "0" indicates that aircraft will be recovered in the same 3-hour period in which they are launched.

The bottom line refers to a stop criterion for the battle. If a "1" is entered, all missions including defensive missions must go to their completion by either side to stop the battle. If a "0" is entered, only offensive missions, as specified in the respective operations plan computer tables must be completed. In either case a maximum of 10 days of action is generated. Defensive missions are those that employ VFCAP, DLI, or SUCAP units for Blue and SLI units for Red.

3. COA Data

COA data are expected to be of major concern to the user in solving decision problems. These data provide the flexibility for describing various COAs such as timing, use of assets, force position, weather, and threat action.

Operations Plans--The timing, use of assets, and threat action are specified in the Blue and Red operations plan computer tables, shown in Exhibits 11 and 12. In the operations plan table, each offensive and defensive mission is defined by specifying a mission name, priority, origin complex, target complex, start and stop mission times, type of unit, desired number of units, minimum number of units, and number of ready units. Each force can have as many as 17 missions.

The mission name is arbitrarily assigned to identify each mission and may be the same as a unit. The priority of the mission indicates the preferred order for assigning elements to perform missions, with priority 1 missions allocated resources first. Missions may be assigned priorities

EXHIBIT 11

BLUE OPERATIONS PLANS

MISSION	P	ORIGIN COMPLX	TARGET COMPLX	START	STOP	MISSION TIMES	UNIT TYPE	SUB	DES UNT	MIN UNT	RDY UNT
-ESCR1-	2	CTFRC	ONRAF	DAY1	DAY1	1234	ESCOR	A	4	2	
-STRK1-	2	CTFRC	ONRAF	DAY1	DAY1	1234	ALPHA	A	6	4	
-ESCR3-	2	CTFRC	ONRAF	DAY2	DDA75	13	ESCOR	A	4	2	
-STRK3-	2	CTFRC	ONRAF	DAY2	DDA75	13	ALPHA	A	6	4	
-ESCR4-	2	CTFRC	ONRAF	DDA75	DOA90	13	ESCOR	A	2	2	
-CLEAN-	2	CTFRC	ONRAF	DDA75	DOA90	13	ALPHA	B	6	4	
-STRK2-	2	CTFRC	ONRAF	DAY1	DOA75	6	ALPHA	C	2	1	
- -											
-CAP1 -	1	CTFRC		DAY1	ENDSTRK3	12345678	VFCAP		3	1	
-DLI1 -	1	CTFRC		DAY1	ENDSTRK3	23	DLI		1	1	
-CAP2 -	1	CTFRC		ENDSTRK3	ENDCLEAN	12345678	VFCAP		1	1	
-DLI2 -	1	CTFRC		ENDSTRK3	ENDCLEAN	23	DLI		1	1	
-SUCAP-	1	CTFRC	REDCA	DAY1	DOS100	1234	SUCAP		1	1	
- -											
- -											
- -											
- -											

EXHIBIT 12

RED OPERATIONS PLANS

MISSION	P	ORIGIN COMPLX	TARGET COMPLX	START	STOP	MISSION TIMES	UNIT TYPE	SUB	DES UNT	MIN UNT	RDY UNT
-VBFHT-	1	ONRAF	CTFRC	DAY2	DOS50	23	VBF	A	2	1	
-FREE -	2	ONRAF	CTFRC	DAY1	DOS50	23	FREE	A	3	2	
-SLI1 -	1	ONRAF		DAY1		1234	SLI		16	1	
-SSMHT-	1	REDCA	CTFRC	DAY2	DOS50	23	SSM		2	1	
- -											
- -											
- -											
- -											
- -											
- -											
- -											
- -											
- -											
- -											
- -											
- -											

0 through 9. Priority 1 and 2 missions that cannot be filled in a particular period are rescheduled for a later period the same day. No missions are rescheduled for following days, however. No mission having a priority of 3 or greater will be rescheduled if unfilled. If a mission has a priority 0, it is not scheduled. Thus, assigning a mission a priority of 0 is a convenient way to eliminate a mission for a particular run.

The start and stop times for a mission can be specified in several ways. One way is to enter DAY, followed by the number of the day in the battle when the subject mission is to be initiated or terminated. A second way is to enter END, followed by the name of a previous mission. In this case, for start times, the mission will begin the day after the previous mission terminates. When END is used as a stop time, the mission will be terminated the day the previous mission is terminated. A third way of designating start and stop times is to enter DOA, DDA, DOS, DDS, or DLS (meaning destroy offensive air, destroy defensive air, destroy offensive surface, destroy defensive surface, or destroy logistics support, respectively), and then to enter the level of destruction of the associated elements at the target complex desired before the mission is to be initiated or terminated. For example, the DDA75 stop time for mission STRK3 in Exhibit 11 means that mission STRK3 is to be terminated when 75% of the defensive air elements at the target complex, ONRAF, have been destroyed. A blank entry for a stop time indicates that the mission is to be continued indefinitely.

Each mission must have an origin complex specified from which all units that comprise the mission must be formed. All offensive missions must be assigned a target complex. A target complex needs be assigned only to those defensive missions with a start or stop time given as one of the following contingencies: DOA, DDA, DOS, DDS, or DLS. The target complex specified for a defensive mission refers to the complex to which the start or stop contingency applies. The complexes named as the origin

and target of a mission must be defined in the scenario data (computer tables 8 and 9).

For computing battle results, the day is divided into eight, 3-hour periods. For mission times, the user specifies the period in which each mission is to be performed. The type and subtype of unit that is to perform each mission must also be specified by name. Force unit names must have been defined in the background data (in both force unit definition and engagement statistics computer tables). The desired units indicate the number of units the user desires to have assigned at each repetition of the mission. The minimum number of units designates the smallest number of force units to be assigned at each repetition of the mission. If resources are insufficient for assigning the minimum number of units to a mission, the mission is not flown during that time step. Ready units, which are used for defensive missions, are those units reserved to replace resources that become exhausted during a period such as in DLI or VFCAP.

Force Position and Weather--COA data that indicate force position and weather parameters are provided in computer tables in the form shown in Exhibits 13 and 14, respectively. The relative position (LONG or SHORT) between each pair of Red and Blue complexes must be specified. If no relative position is specified, LONG is assumed. The use of (LONG or SHORT) relative positions is an option to allow the attacking TFC to employ his forces to fullest advantage. If the TFC (user) is attacking an enemy airbase, he may launch his attack from a LONG position in order to use his aircraft range advantage and decrease the threat against him by any lesser range enemy aircraft.

The days of battle when weather (GOOD or BAD) changes occur are specified in computer table 14. The weather remains the same between days of change and is assumed to be GOOD if no weather is otherwise specified. If one or more days of battle are changed to BAD by the TFC, alternate

EXHIBIT 13

BLUE / RED	RELATIVE COMPLEX POSITIONS							
	CTFRC							
ONRAF	LONG							
ORGAF	LONG							
REDCA	SHORT							

EXHIBIT 14

	INITIATING WX DAYS								
DAY	1								
WX	GOOD								

force units are employed, thereby allowing the TFC to examine bad weather contingencies.

C. Output

Three types of battle outcomes are generated by SOC: mission accomplishment results, battle attrition results, and an aircraft expenditure summary. Blue and Red mission results are given in Exhibits 15 and 16, and basically show the operations plans specified by the user. The start and stop times, which became activated because of the termination of missions or destruction of targets, are displayed by day of occurrence. Otherwise, the data element does not change. The total number of units requested for each mission during the battle is shown, together with units actually engaged. If a default unit is activated, the number of units requested and engaged contributes to those statistics. As with all the output computer tables, a user-supplied run identification (i.e., ONRODA) is printed out along with the length of the battle (i.e., 2 days).

Blue and Red battle attrition results are shown in Exhibits 17 and 18. For each complex, the number of elements of each type attrited, together with the total elements assigned, is shown. The number of airbase and CV elements at a complex shown as lost does not include those damaged and subsequently repaired.

An aircraft expenditure summary is also generated as shown in Exhibit 19. The daily cumulative expenditure of Blue aviation sorties and aircraft attrition due to air-to-air, ground-to-air (SAM), and air-to-ground (enemy attack) engagements is shown. Red is summarized by offensive and defensive aircraft categories as categorized by computer table 1. The final cumulative attrition results should correlate with computer tables 17 and 18. In practice, however, they may deviate slightly because of round off error in computer table 19. Thus, for example we see a total of 5 Blue AW losses in Exhibit 19 and 6 Blue AW losses in Exhibit 17.

EXHIBIT 15

ONRODA BLUE MISSION ACCOMPLISHMENT RESULTS DAYS= 2

MISSION	P	ORIGIN COMPLX	TARGET COMPLX	START		STOP		MISSION TIMES	UNIT TYPE	SUB	DES UNT	UNT REQ	UNT ENG
ESCR1	2	CTFRC	ONRAF	DAY	1	DAY	1	1234	ESCOR	A	4	16	16
STRK1	2	CTFRC	ONRAF	DAY	1	DAY	1	1234	ALPHA	A	6	24	24
ESCR3	2	CTFRC	ONRAF	DAY	2	DAY	1	13	ESCOR	A	4	0	0
STRK3	2	CTFRC	ONRAF	DAY	2	DAY	1	13	ALPHA	A	6	0	0
ESCR4	2	CTFRC	ONRAF	DAY	2	DAY	2	13	ESCOR	A	2	4	4
CLEAN	2	CTFRC	ONRAF	DAY	2	DAY	2	13	ALPHA	B	6	12	12
STRK2	2	CTFRC	ONRAF	DAY	1	DAY	2	6	ALPHA	C	2	4	4
CAP1	1	CTFRC		DAY	1	DAY	1	12345678	VFCAP		3	24	24
DLI1	1	CTFRC		DAY	1	DAY	1	23	DLI		1	2	2
CAP2	1	CTFRC		DAY	2	DAY	2	12345678	VFCAP		1	8	8
DLI2	1	CTFRC		DAY	2	DAY	2	23	DLI		1	2	2
SUCAP	1	CTFRC	REDCA	DAY	1	DOS	100	1234	SUCAP		1	8	8

EXHIBIT 16

ONRODA RED MISSION ACCOMPLISHMENT RESULTS DAYS= 2

MISSION	P	ORIGIN COMPLX	TARGET COMPLX	START		STOP		MISSION TIMES	UNIT TYPE	SUB	DES UNT	UNT REQ	UNT ENG
VBFHT	1	ONRAF	CTFRC	DAY	2	DOS	50	23	VBF	A	2	4	2
FREE	2	ORGAF	CTFRC	DAY	1	DOS	50	23	FREE	A	3	12	9
SLI1	1	ONRAF		DAY	1			1234	SLI		16	128	62
SSMHT	1	REDCA	CTFRC	DAY	2	DOS	50	23	SSM		2	4	1

EXHIBIT 17

ONRODA BLUE CMPLX BATTLE ATTRITION RES. DAYS= 2

BLUE COMPLEX	ELEMENTS ATTRITED / TOTAL ELEMENTS AT COMPLEX					
	VA	AW	VF LO	VF HI	CV	SUPSHIP
CTFRC	19.	6.	0.	22.	0.0	0.0
	48.	24.	0.	48.	2.0	12.0

EXHIBIT 18

ONRODA RED COMPLEX BATTLE ATTRITION RESULTS DAYS= 2

RED COMPLEX	ELEMENTS ATTRITED / TOTAL ELEMENTS AT COMPLEX							
	BR LO	BR HI	VBF	VFI	SSMSHIP	AIRBASE	SAM	SUPLINE
ONRAF	24.	0.	72.	72.	0.0	0.0	18.0	0.0
	24.	0.	72.	72.	0.0	1.0	18.0	0.0
ORGAF	36.	0.	36.	0.	0.0	0.0	0.0	0.0
	36.	0.	72.	72.	0.0	1.0	27.0	0.0
REDCA	0.	0.	0.	0.	0.6	0.0	0.0	0.0
	0.	0.	0.	0.	1.0	0.0	0.0	0.0

EXHIBIT 19

ONRODA AIRCRAFT EXPENDITURE SUMMARY DAYS= 2

	BLUE VA				BLUE AW				BLUE VF-LO				BLUE VF-HI				CUM RED	
DAY	CUM SORTIES	CUM LOSS TO A-A	G-A	A-G	CUM SORTIES	CUM LOSS TO A-A	G-A	A-G	CUM SORTIES	CUM LOSS TO A-A	G-A	A-G	CUM SORTIES	CUM LOSS TO A-A	G-A	A-G	LOSSES OA	DA
1	76	11	7	0	32	3	2	0	0	0	0	0	68	17	2	0	87	71
2	116	11	8	0	52	3	2	0	0	0	0	0	96	19	2	0	168	72

III SOC BATTLE LOGIC

A. General Description

The logic in SOC's computational algorithm is straightforward. The algorithm basically carries out the operations plans specified in the COA data, using the scenario and background data for information on force composition, effectiveness, and availability. Numerical computations are at the level of aggregation of the data in the aggregate data base, Thus, credible estimates of battle outcomes, at the level of concern of the user, are generated.

A macroflow chart of the SOC algorithm is shown in Figure 2. Each day of the battle is simulated successively. For each day, the days missions are scheduled in advance. The activities for each time step of the day are then performed. In each time step, first the schedule is modified in regard to past action (i.e., aircraft loss). Next, aircraft returning from missions begun in previous time steps are recovered. After this recovery has taken place, the aircraft to be used in missions begun during the current time step are launched. Next, forces engage followed by the recovery of surviving aircraft that performed missions during the current time step. After the day's activities the algorithm either ends or the next day's activities are initiated.

B. NEWRUN

At the beginning of each run an initialization process takes place. After this initialization has taken place, each day of the battle is simulated.

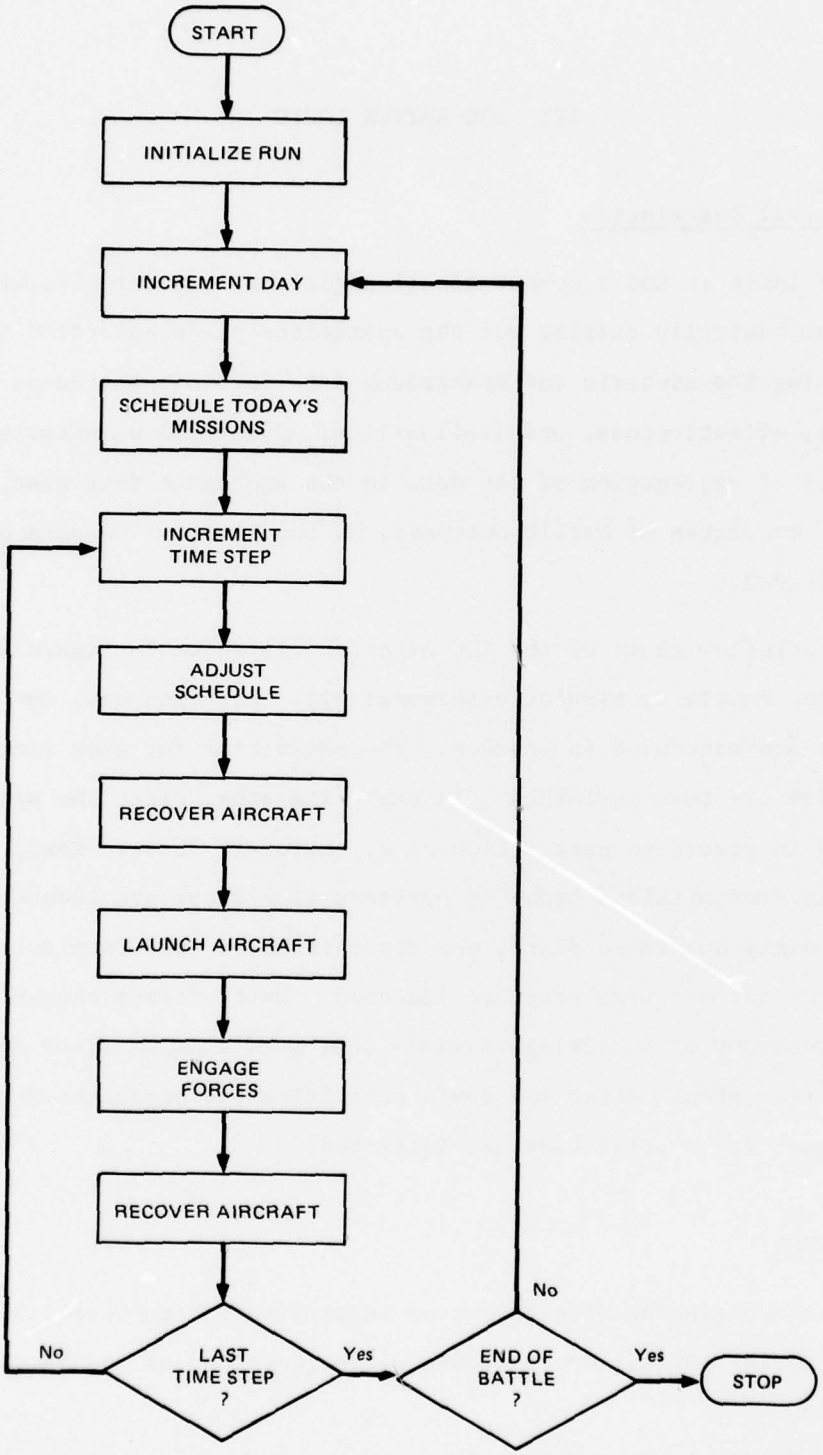

FIGURE 2. MACROFLOW CHART OF SOC COMPUTATIONAL ALGORITHM

C. NEWDAY

At the beginning of each new day, initialization for the day takes place and the live and killed elements at each complex are accounted for. In addition, mission start and stop times are updated. Depending on how the start times are specified in the input tables, mission start times remain the same, are set to the day following the completion of a previous mission, or are assigned to the day after a specified destruction level has been reached at a given complex. Likewise, depending on information in the input tables, stop times remain the same, are set to the day a previous mission ends, or are assigned to the day when a specified destruction level is reached at a given complex.

D. SCHEDULE

Each day is broken into eight 3-hour time periods that are sequentially simulated. At the beginning of each new day, the day's missions for both Blue and Red forces are scheduled. A mission is not scheduled if the current day precedes the start date of a mission or occurs after the stop date of the mission. If a mission is assigned a priority of zero or there is less than 1 unit requested by a mission, the mission is not scheduled. If a complex is designated as able to perform only defensive missions during replenishment and is undergoing replenishment during the current days, no offensive missions originating from that complex are scheduled. Note that missions using type SUCAP, VFCAP, or DLI units for Blue or SLI units for Red are defensive missions. All other type missions are offensive missions.

Under poor weather conditions, any mission requesting good weather units, for which no bad weather default units are specified, is not scheduled. Similarly, any long-range mission that requests short-range units that have no long-range default units specified, is not scheduled. If a long-range

mission is requested in bad weather, a long-range poor-weather unit must be specified in the input table as able to perform the mission; otherwise, the mission is cancelled.

At the beginning of each time step the ability of each complex to perform operations is increased according to the repairs that can be made in one time period. The level of operation of each complex can never be brought above the maximum capacity specified in the input tables. Additionally, the number of elements available at each complex is increased by making elements available, that have been rearmed and refueled.

With each time step, the schedule of missions is modified. Priority 1 and 2 missions unfilled in the previous time step of the current day are rescheduled for the current time step, provided an identical mission is not already scheduled. No rescheduling of missions from previous days occurs.

Once all missions for the remainder of the day have been updated, a check is made to determine if sortie rates will be exceeded. The missions are checked in order of priority, with priority 1 missions checked first. Missions of equal priority are checked starting with the current time step and proceeding sequentially throughout the day. Missions of the same priority, occuring during the same time step, are checked according to the order they occur in the operation plan tables. Priority 1 missions will be cancelled only if the 30-day maximum sortie rate is predicted to be exceeded. Priority 2 missions will be cancelled for the same reason and also if the surge sortie rate is predicted to be exceeded. Priority 3 through 9 missions will be cancelled for the same reasons and if the normal sortie rate is estimated to be exceeded. Note that any mission cancelled at this point is not rescheduled and that each mission checked adds to the estimated number of sorties for the aircraft involved. Thus, if priority 1 and 2 missions exceed the normal sortie rate, but not the surge sortie rate of an aircraft, those missions will remain scheduled. However, all missions of priorities 3 through 9 using that type of aircraft that day will be cancelled.

E. RECOVER

Once desired missions for both Blue and Red have been scheduled for the current time period, aircraft at all complexes are recovered one at a time from previous missions without preference for aircraft type or mission. When the number of operations available at a complex is reached, recovery ceases, and unrecovered aircraft wait until the next step to be recovered.

F. LAUNCH

After the recovery of aircraft has taken place, an attempt to fill missions and launch aircraft is made. Missions are filled in order of priority. Missions of the same priority are filled in the order they appear in the operation plans table. Each mission is assigned as many requested units as possible, within the maximum requested, subject to unit availability, the availability of launch operations, and sortie restrictions. Priority 1 and 2 missions can be flown, provided the surge sortie rate is not exceeded. Priority 3 through 9 missions can be flown only if the normal sortie rate is not exceeded. Under no circumstances can the 30-day sortie rate be exceeded.

A mission is flown only if the minimum number of specified units can be assigned to it. A mission that requests ready units (i.e., units reserved for launch as needed for replacements to a mission such as DLI) is assigned as many ready units as requested or possible if the mission has enough aircraft assigned to it to be flown. A mission need not have any ready units assigned to it to be flown. Aircraft assigned a ready status are unavailable for other missions. It is assumed that all aircraft assigned to missions in a given period are launched at the same time.

G. ENGAGE

The battle losses incurred when one side strikes the other are computed by using the engagement statistics provided in the SOC aggregate data base. The aircraft or surface-to-surface missiles of an incoming strike are subject of attrition by air and surface defenses before they can inflict air-to-surface damage. The defending units are those associated with the target complex of the strike.

Offensive strikes are considered one at a time. First, Blue strikes are considered according to the order they appear in the operation plans table. Next, each Red strike is considered according to the order in Red's operation plans table.

An incoming strike is first engaged by any airborne VFCAP at the target complex. Then, any DLI or SLI may engage the strike. Ready units are used to refill the VFCAP and DLI or SLI positions vacated by the engaging defenders. The refilled VFCAP are then used to attack the incoming strike with subsequent defense by the refilled DLI or SLI. This refilling and attacking sequence continues. There are, however, constraints on the use of the air defenders assigned to VFCAP, DLI, and SLI missions to attack incoming strikes. First, no more air defenders are engaged than necessary to annihilate an incoming raid. Second--based on the range at which the incoming strike force is detected, the speed of the incoming strike, the delay until the first defender (on the deck or ground) can be launched, and the time between launches--, the number of defenders that can be engaged with the strike before its attack on the target complex is limited.

The losses incurred by the incoming strike and the air defenders during the air-to-air combat are based on the engagement statistics supplied in computer tables 4 and 5. The losses are calculated by postulating a simultaneous exchange between the forces. These losses are

assumed to be a linear function of the number of force units in the strike and the number of defenders engaging the strike.

After the air-to-air battle, any surface-to-air defensive elements are assumed to have a shot at the remaining attackers. Surface-to-air capabilities may be specified by the user for Blue carriers and support ships and for Red SAM-sites and supply lines.

The portion of strike force that penetrates the defenses inflicts air-to-surface losses on the elements at the target complex. Only the parked, unsheltered aircraft (as specified by the user in the scenario data) are subject to destruction. The number of parked aircraft of each type that is destroyed is proportional to the ratio of parked aircraft of each type to the total parked aircraft.

Some logic is peculiar to the Red SSM attack. If an SSM attack is imminent, the program assumes that airborne SUCAP (associated with the Blue complex to be attacked) attack the SSM-ships from which the SSM attack is to be mounted. Only the portion of the ships that survive this attack is assumed to launch their missiles (at a rate of 8 missiles per undamaged ship). Ready units associated with a SUCAP mission are launched and attack the remaining SSM-ships after the ship's missiles have been launched. All attacking SUCAP are subject to attrition by any air-to-air and surface-to-air defenses associated with the force complex to which the SSM-ships belong. The missiles launched are subject to air-to-air and surface-to-air attrition by the defenses of the Blue complex under attack. The sequencing of the engagements of the SUCAP and SSM missiles with air and ground defenses and of the air-to-surface attacks is treated as previously described for offensive strikes.

The aircraft, both defensive and offensive, that survive are scheduled to land either in the current time step or some future time step. The

scheduled landing at the home complex is based on the user-specified (computer table 10) mission times for LONG and SHORT missions.* VFCAP, DLI, and SLI are scheduled to land at the end of the time step in which they were launched. Aircraft ready to land are recovered at the end of each time step, subject to the operations available at carriers and airbases.

All attrition computations are assumed to be linear functions of the numbers of units of force elements engaging. The losses at each of the force elements at each of the force complexes are computed and used to maintain an updated inventory of Blue and Red assets. These results are needed to determine the capability to perform future missions; they are also presented to the user in the battle results computer tables.

---

*If aircraft are scheduled to land at the end of the time step in which they are launched, the mission time is specified as zero time steps.

IV SOC MAN-MACHINE INTERACTION

A. Interactive Commands

Given a computer terminal with a CRT and a printer, the communicator portion of SOC allows the user to display and modify all the data in the data base, exercise the computational algorithm, and obtain printed copy of any of the data and results. The communicator commands follow:

1. LOAD INPUT

This command is used to retrieve a data base that has previously been created and saved.

2. SAVE INPUT

This command saves the current data for future use.

3. DISPLAY/INPUT TABLE

This command displays a particular table with its associated data, if any. Once a table is displayed, it may be edited. During editing, either current data may be changed, or a new data base can be created if the current data base is empty.

4. PRINT TABLE

This command is used to print tables on a line printer.

5. RUN

This command causes the execution of the battle logic using the currently loaded data base.

6. STOP

This command terminates SOC and returns control to the operating system.

7. LIST TABLES

This command list the titles of all the tables on the CRT screen.

8. EXPLAIN ABOVE FUNCTIONS

This command provides the user with explanations of each of the other commands.

B. Command Use

A typical session for using SOC will begin by turning on the console and following a standard procedure for getting on-line to the computer. When SOC is loaded and entered, queries and instructions that require user interaction will appear on the screen. The questions and instructions posed to the user are self-explanatory. They begin with a choice of a CRT that SOC runs with. The user corresponds with a number as indicated to show the terminal type he is using. Only specified types will work with SOC. Quickly thereafter the user is led to the function menu that presents the 8 commands above for him to execute.

If the user wishes to refresh his memory, he can issue the EXPLAIN ABOVE FUNCTIONS command and receive a brief description of SOC communicator functions on the console. The user then depresses the space bar to return to the function menu. The user can then ask for a list of the titles of the aggregate data base computer tables by issuing the LIST TABLES command. If background, scenario, or COA data that were used and saved in a previous session, are of interest, they can be retrieved and placed in the current aggregate data base by issuing the LOAD INPUT command.

If a new data base is desired, no old data base will be loaded but the DISPLAY/INPUT TABLE command should be repeated until all 14 input tables are established. This must be done sequentially from table 1 to table 14 so that error routines can be established to check for logical consistency. When the user executes this command, he is queried for the table of interest. When a table number is specified, the table is displayed on the screen. If there is a current data base, the information associated with the specified table is displayed in addition to the table form. The user can now enter new table data or modify the existing table.

Data are changed or entered by moving the cursor to the appropriate field, using tab, carriage return, and cursor control keys, and then entering the new data. After a table has been filled with new data, the user hits the transmit key (or combination of the CONTROL and Q keys if no such key exists) to initiate error checking. If no errors occur, the table is entered into the current data base and the user is returned to the function menu. If errors occur, indications are given and the table is redisplayed and the editing process repeated. If during the editing process the user wishes to revert to the original table rather than continue editing or he merely wished to display the table, he hits the transmit key immediately after the table is displayed and he is then returned to the function menu. Once a data base has been established as above, or loaded using the LOAD INPUT command, it can be edited in random order.

When the current data base properly describes a COA that the user wants to evaluate, the RUN command is issued. On executing this command, the algorithm computes the battle results using the data in the current first 14 computer tables of the aggregate data base and places the results in the computer tables 15 through 19. Using the DISPLAY/INPUT TABLE command, the user can now have the results displayed on the console. Printouts (hard copy) of any of the data or results tables can be obtained using the PRINT TABLE command.

The user may evaluate a series of alternative COAs by sequentially modifying data tables, running the algorithm, and then displaying and/or printing the results. After all COAs have been evaluated, the user may issue the SAVE INPUT command. This will transfer the current contents of the aggregate data base to computer storage for future use. The STOP command terminates the session.

Appendix A

ONRODA PROBLEM SCENARIO

Appendix A

ONRODA PROBLEM SCENARIO

The problem scenario and resulting concept of operations described in this appendix have been extracted from the following document: "ONRODA Warfare Scenario," Research Memorandum NWRC-RM-83, Stanford Research Institute (June 1975). This document can be used to augment the information presented in this appendix if it is desired; however, it is broader in its scope and a few of its details are different. Every effort has been made in this appendix to present the major elements of the problem as simply as possible. A synopsis of the scenario follows.

Synopsis

Grey and Orange (see Figure A-1) have been ideologically opposed and hostile toward each other for a long time. Orange has supported rebel activities in Grey. ONRODA Island has been politically aligned with Grey but has a significant segment of Orange sympathizers. Grey's military capability has diminished and Orange responds by more active support of the rebels in Grey and by capturing ONRODA Island. Blue has previously indicated that this was an unacceptable action, supported Grey's appeal to the UN, and asked for congressional approval for unilateral support of Grey if favorable UN reaction was not immediate. At the same time, Blue orders the fleet to prepare to stablize the military situation in the area and prevent Orange from using ONRODA Island as a base for future military action against Grey. Red, who has supplied Orange with most of her combat systems, also has a naval force in the area. A Blue carrier task force is formed and given the mission: "When directed, begin operations to neutralize Orange forces and facilities on ONRODA Island in order

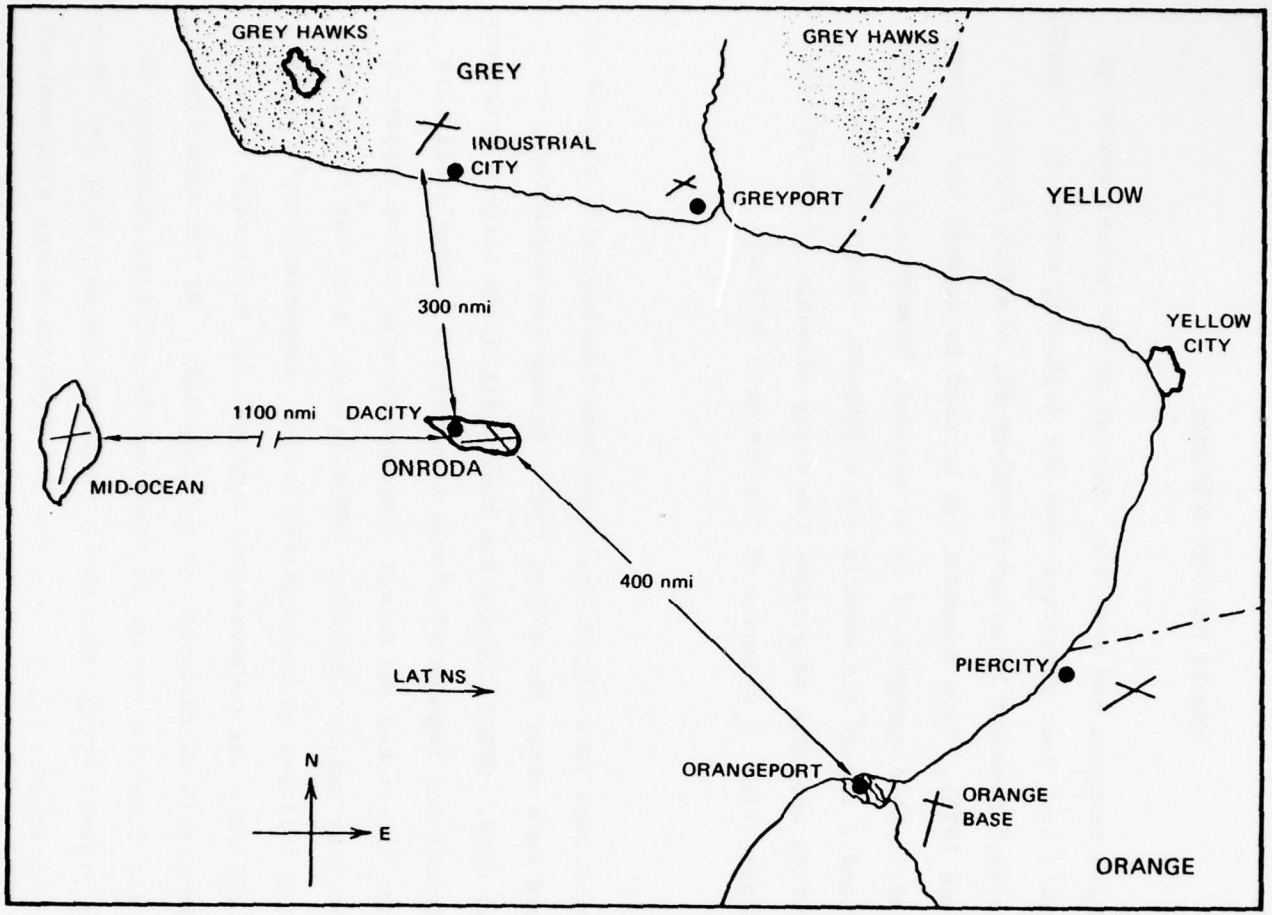

FIGURE A–1 AREA MAP

to defend Grey. Do not attack targets on Orange mainland or in Orange ports. Take defensive measures to protect your force from Orange or Red retaliations."

The Blue task force is divided into two carrier groups and consists of the elements listed in Table A-1. The enemy forces in the area are listed in Table A-2.

Concept of Operations

The tentative choices for Blue COAs are:

- Neutralizing enemy forces by preemptive or reactive air strike*
- Neutralizing enemy forces by air blockade
- Employing both reactive air strike and air blockade to neutralize enemy forces.

After much consideration, the TFC selects the third alternative and orders that a concept of operations be developed for the reactive air strike and subsequent air blockade. The concept of operations follows.

To defend Grey, the Blue task force will conduct air strikes, when directed, against Orange forces on ONRODA Island. This operation will defend Grey from Orange air attacks, in particular from ONRODA Island. The physical targets are the Orange combat aircraft and support facilities on ONRODA Island. Orange forces on the Orange mainland or in Orange ports cannot be attacked. It is expected that no nuclear weapons will be used.

Red units may be sighted in the area. There is a low probability that Red will initiate hostile action toward Blue, but Red is expected

---

*Note: The different elements in a preemptive air strike, as compared to a reactive air strike, might be considered to be more surprise to the enemy, stronger offensive forces, higher mission accomplishment in less time, and fewer defensive forces needed.

Table A-1

BLUE TASK FORCE MAJOR COMBATANTS

CARRIER GROUP ONE

Type	Class
CV	KITTY HAWK
CG	ALBANY
DDG	CHARLES F. ADAMS
DD	SPRUANCE
DD	GEARING (FRAM I)
DE	KNOX (with BPDMS and LAMPS)
DE	KNOX (with BPDMS and LAMPS)

CARRIER GROUP TWO

Type	Class
CV	FORRESTAL
CLG	converted CLEVELAND
DLG	LEAHY
DD	SPRUANCE
DD	GEARING (FRAM I)
DD	GEARING (FRAM I)
DE	KNOX (with BPDMS and LAMPS)

AIR WING COMPOSITION (each CV)

24	F-14
24	A-7E
12	A-6E
8	S-3A
5	E-2C
4	EA-6
4	KA-6
4	SH-3
1	C-1

Table A-2

ENEMY MAJOR COMBATANTS

ORANGE NAVAL FORCES

Number	Type	Class
4	Destroyer	SKORY
6	Missile Boat	OSA-1
6	Missile Boat	KOMAR
12	Torpedo Boat	P6
2	Minesweeper	T-43
5	Amphibious Craft	VYDRA
2	Submarine	W

RED NAVAL FORCES

Number	Type	Class
1	Cruiser	KRESTA I
1	Destroyer	KASHIN
2	Submarine	ECHO II

ORANGE AIR FORCES

at ONRODA		at ORANGE	
24	MIG-19	48	MIG-19
72	MIG-21	72	MIG-21
48	SU-7	24	SU-7
24	IL-28	12	IL-28
		24	BADGER A

to harass and surveil individual Blue units. Orange units may also surveil the Blue forces before air strikes begin. Blue forces are ordered not to take preemptive hostile action against such activities but to defend themselves by return fire if fired upon.

The two carrier groups making up the Blue task force will operate independently, approximately 50 to 100 nmi apart. The strike launch point will be 400 nmi west of ONRODA Island. On the first strike day (S-day) four Alpha strikes will be launched against ONRODA--two strikes from each carrier. Each Alpha strike will be composed of 18 A-7s, 6 A-6s, 10 F-14 escorts, 1 E-2 strike control, 1 EA-6 for EW, and 3 KA-6 refuelers. On each succeeding day (S+1, S+2, etc.) strike carrier duty will be alternated between carriers, with each carrier launching two strikes a day. Additionally, an Intruder strike will be flown by four A-6s plus 2 F-14s at night. The Intruder strike composition will be substituted for the Alpha strikes if the weather turns bad. The off-duty strike carrier will fly the task force defensive sorties. "Clean-up" strikes are desired when the enemy defensive air assets have been reduced 75%.

The defensive carrier will provide fighter aircraft to support three CAP stations during its 24-hour defensive duty. Each carrier group will provide its own ASW daily aircraft requirements. If enemy surface units threaten the task force, a SUCAP (surface cap) of A-7s and A-6s will be called on. It is highly probable that Badger-A bombers escorted by MIG-21s with external tanks may attack the task force from Orange mainland sometime after Blue strikes ONRODA.

After Orange aircraft are neutralized on ONRODA Island, the task force plans to change station to a point midway between ONRODA and Grey from which it will set up an air blockade to protect both Grey from attack and ONRODA from reinforcements.

Appendix B

SOC PROGRAM LISTINGS

```
00057          NIT=14
00058          MAXFLD=16
00059          MAXROW=17
00060          DO 30 I=1,2
00061          DO 30 J=1,MAXCMP
00062       30 ICMPLX(I,J)=NULL
00063          DO 50 I=1,NIT
00064          DO 50 J=1,MAXFLD
00065          DO 50 K=1,MAXROW
00066       50 ITABLE(I,J,K)=NULL
00067     C
00068     C-------PRINT PROGRAM TITLE
00069          WRITE(5,1000)
00070     C
00071     C-------INITIALIZE TERMINAL DATA
00072            CALL INIT
00073     C
00074     C-------OUTPUT GENERAL PREFACE
00075          CALL NWSCRN(0)
00076          WRITE(5,1001)
00077          WRITE(5,1002)
00078     C
00079     C-------MONITOR AND COMPLY WITH TERMINAL DIALOGUE
00080            CALL MONTR(ITABLE)
00081          STOP
00082     C
00083     C-------FORMATS
00084     1000    FORMAT('0SOC PROGRAM VFR(4.0), SRI INTERNATIONAL'//)
00085     1001    FORMAT(69H THE OUTCOME CALCULATOR PRODUCED BY NWRC/SRI IS NOW AT
00086          1OUR DISPOSAL./1H ,
00087          264HTHE PURPOSE OF THE OUTCOME CALCULATOR IS TO PROVIDE QUANTITATIV
00088          3E/1H ,
00089          464HESTIMATES OF OUTCOMES FOR NAVAL AIR STRIKE ALTERNATIVE COURSE O
00090          5F/1H ,
00091          617HACTION DECISIONS./1H ,/1H ,/1H )
00092     1002    FORMAT( ' ANSWERS TO QUESTIONS ASKED OF YOU BY THE OUTCOME ',
00093          1  'CALCULATOR',/,' MUST BE FOLLOWED BY A CARRIAGE RETURN.'//)
00094           END
```

```
00001   C
00002   C      THIS PROGRAM CONSTITUTES THE INTERACTIVE VERSION
00003   C      OF THE STRIKE OUTCOME CALCULATOR, BUILT FOR THE ONR ODA PROGRAM.
00004   C
00005   C                          NWRC/SRI  1976,1977
00006   C
00007   C       DISK20=FILE TO READ PREVIOUSLY SAVED DATA
00008   C       DISK21=FILE TO WRITE DATA SAVED FROM THIS RUN
00009   C       DISK23=PERMFILE CONTAINING FORMS OUTLINES
00010   C
00011         DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00012         DOUBLE PRECISION ITABLE,ITEMP,ISTORE,NULL
00013         COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00014        +               IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00015         COMMON /SPECS/ ITABER, ITABLR, ITABNR, ITABNE, IFLDS(14,15),
00016        1               IRLNK(15,17), IFORMT(2,19)
00017         COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00018         DIMENSION ITABLE(14,16,17),ITEMP(19,17)
00019   C
00020   C------THIS IS AN ERROR CHECKING ACTION TABLE, THE FOLLOWING
00021   C       IS A DESCRIPTION OF THE CURRENT ENTRIES.
00022   C
00023   C      VALUE      ERROR ACTION
00024   C        0        CHECK FOR ALPHA
00025   C        1        CHECK FOR NUMERIC
00026   C        2        CHECK FORCE UNIT DEFINITION
00027   C        3        CHECK FOR COMPLEX ON LIST
00028   C        4        CHECK FOR MISSION PRESENTS ON APPROPRIATE LIST(NOT IMPL)
00029   C        5        CHECK FOR "LONG" OR "SHORT"
00030   C        6        CHECK FOR "GOOD" OR "BAD"
00031   C        7        CHECK REPL OPS
00032   C        8        CHECK START/STOP FIELDS
00033   C
00034           DATA(IFLDS(01,K),K=1,15) /0,0,0,0,0, 0,0,0,0,0, 0,0,0,0,0/
00035           DATA(IFLDS(02,K),K=1,15) /0,0,1,1,1, 1,1,5,2,6, 2,1,1,0,0/
00036           DATA(IFLDS(03,K),K=1,15) /0,0,1,1,1, 1,1,5,2,6, 2,1,1,0,0/
00037           DATA(IFLDS(04,K),K=1,15) /0,0,1,1,1, 1,1,1,1,1, 1,1,1,0,0/
00038           DATA(IFLDS(05,K),K=1,15) /0,0,1,1,1, 1,1,1,1,1, 1,0,0,0,0/
00039           DATA(IFLDS(06,K),K=1,15) /1,1,1,0,0, 0,0,0,0,0, 0,0,0,0,0/
00040           DATA(IFLDS(07,K),K=1,15) /1,1,1,1,0, 0,0,0,0,0, 0,0,0,0,0/
00041           DATA(IFLDS(08,K),K=1,15) /0,1,1,1,1, 1,1,1,1,1, 1,1,7,0,0/
00042           DATA(IFLDS(09,K),K=1,15) /0,1,1,1,1, 1,1,1,1,1, 1,1,1,1,7/
00043           DATA(IFLDS(10,K),K=1,15) /1,0,0,0,0, 0,0,0,0,0, 0,0,0,0,0/
00044           DATA(IFLDS(11,K),K=1,15) /0,1,3,3,8, 8,1,0,2,1, 1,1,0,0,0/
00045           DATA(IFLDS(12,K),K=1,15) /0,1,3,3,8, 8,1,0,2,1, 1,1,0,0,0/
00046           DATA(IFLDS(13,K),K=1,15) /5,5,5,5,5, 5,5,5,0,0, 0,0,0,0,0/
00047           DATA(IFLDS(14,K),K=1,15) /6,6,6,6,6, 6,6,6,6,6, 0,0,0,0,0/
00048   C
00049   C
00050         DATA NULL/6H      /
00051   C
00052   C-------INITIALIZE TABLE DATA
00053         CALL ERRSET(0)
00054         MAXCMP=8
00055         MAXUNT=15
00056         MAXMIS=17
```

```
00001          SUBROUTINE MONTR(ITABLE)
00002    C
00003    C     THIS ROUTINE MONITORS INTERACTIVE VERSION OF THE OUTCOME CALCULATR
00004    C
00005          DOUBLE PRECISION NULL,ITABLE,ITEMP,CDATE
00006          DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00007          DIMENSION ITABLE(14,16,17),ITEMP(19,17)
00008            COMMON/MODS/IDRUN,IDAY
00009            DOUBLE PRECISION IDRUN
00010          COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00011         +                IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00012          COMMON /SPECS/ ITABFR, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00013         1               IBLNK(15,17), IFORMT(2,19)
00014          COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00015            INTEGER LINES(15)
00016    C
00017    C     ATTACH PERM FILE WITH FORMS LOGICAL UNIT 23
00018    C
00019            CALL DEFINE FILE(23,80,IIN,'SRIFORMS.DAT',0,0)
00020    C
00021    C
00022            IDRUN=NULL
00023          WRITE(5,1002)
00024            WRITE(5,1001)
00025            CALL DUMRD
00026    C
00027    C     FUNCTION MENU CONTROL POINT
00028    C
00029      100 CONTINUE
00030          CALL NWSCRN(0)
00031          WRITE(5,1003)
00032          WRITE(5,1057)
00033          CALL GETINT(IF)
00034          IF(IF .EQ.-3.OR.(IF .GE.1.AND.IF .LE.8)) GO TO 105
00035    C
00036    C     ABORT   FUNCTION
00037    C
00038      102 CONTINUE
00039          CALL NWSCRN(0)
00040          WRITE(5,1006)
00041          CALL DLAY(2)
00042          GO TO 100
00043    C
00044    C     PROCESS LEGAL FUNCTION
00045    C
00046      105 CONTINUE
00047          IF(IF .EQ.-3) IF =9
00048          CALL NWSCRN(0)
00049          GO TO (150,200,300,400,500,600,700,800,300),IF
00050    C
00051    C     LOAD INPUT TABLES
00052    C
00053      150 CONTINUE
00054          CALL SETUP(ITABLE)
00055          GO TO 100
00056    C
```

```
00057   C      SAVE INPUT TABLES
00058   C
00059     200 CONTINUE
00060         CALL SAVET(ITABLE)
00061         GO TO 100
00062   C
00063   C      DISPLAY/INPUT TABLE
00064   C
00065     300 CONTINUE
00066         IF(IF .EQ.9) GO TO 301
00067         WRITE(5,1008)
00068         WRITE(5,2008)
00069     301 CONTINUE
00070         WRITE(5,1009)
00071         WRITE(5,1061)
00072         CALL GETINT(IT)
00073         IF(IT.GE.1 .AND. IT.LE.NIT) GO TO 304
00074           IF(IT.LT.NIT .OR. IT.GT.19) GO TO 102
00075           CALL RDYOUT(IT,ITEMP)
00076           GO TO 306
00077     304 CONTINUE
00078         DO 305 I=1,MAXFLD
00079         DO 305 J=1,MAXROW
00080     305 ITEMP(I,J)=ITABLE(IT ,I,J)
00081   C
00082   C      PRINT SCREEN
00083   C
00084     306 CALL SCRNO(IT ,ITEMP)
00085         IF(IT .LE.NIT) GO TO 308
00086         CALL DUMRD
00087         GO TO 100
00088   C
00089   C      INPUT DATA
00090   C
00091     308 CONTINUE
00092         DO 309 I=1,15
00093         DO 309 J=1,MAXROW
00094     309 IBLNK(I,J)=0
00095         IERR=0
00096         CALL SCRNI(IT ,ITEMP)
00097   C
00098   C      CHECK FOR NO CHANGE IN TABLE
00099   C
00100         IF(IT .EQ.0) GO TO 100
00101   C
00102   C      SET ERROR FLAG IF FIELDS WERE IN ERROR
00103   C
00104         IF(IT.GT.0) GO TO 310
00105         IERR=1
00106         IT=-IT
00107     310 CONTINUE
00108   C
00109   C      DO SUBSEQUENT PROCESSING
00110   C
00111         CALL SUBPRO(IT,ITEMP,ITABLE)
00112         CALL ERROR(IT,ITEMP,IERR,1)
```

```
00113          IF(IERR.EQ.1) GO TO 306
00114            CALL DCODE(IT,ITEMP)
00115    C
00116    C      SAVE ERROR FREE TABLE
00117    C
00118          WRITE(5,1010)
00119          CALL TRSFM(IT ,ITABLE,ITEMP)
00120          CALL DLAY(2)
00121          GO TO 100
00122    C
00123    C      PRINT TABLE
00124    C
00125      400 CONTINUE
00126          WRITE(5,1023)
00127          WRITE(5,1063)
00128          CALL GETINT(IT)
00129    C
00130    C-------CHECK FOR VALID ENTRIES IN RESPONCE TO QUESTION FOR TAB NO.
00131            IF(IT.GE.1 .AND. IT.LE.19) GO TO 410
00132            IF(IT .EQ. 98) GO TO 420
00133            IF(IT .EQ. 99) GO TO 425
00134            IF(IT .EQ. 100) GO TO 430
00135            GO TO 102
00136    C
00137    C-------PRINT OUT INDIVIDUAL TABLE
00138    410     CONTINUE
00139            IB = IT
00140            IE = IT
00141            GO TO 440
00142    C
00143    C-------PRINT OUT INPUT TABLES
00144    420     CONTINUE
00145            IB = 1
00146            IE = NIT
00147            GO TO 440
00148    C
00149    C-------PRINT OUT OUTPUT TABLES
00150    425     CONTINUE
00151            IB = NIT+1
00152            IE = 19
00153            GO TO 440
00154    C
00155    C-------PRINT OUT ALL TABLES
00156    430     CONTINUE
00157            IB = 1
00158            IE = 19
00159            GO TO 440
00160    C
00161    C-------GENERAL LOOP FOR TABLE PRINTING
00162    440     CONTINUE
00163            CALL DATE(CDATE)
00164            CALL TIME(CTIME)
00165            NPP=99
00166    C
00167    C
00168            DO 490 ITT=IB,IE
```

```
00169            NPP=NPP+1
00170            IF(NPP.LE.2) GO TO 450
00171            NPP=1
00172            WRITE(3,1011) CDATE,CTIME
00173    450     CONTINUE
00174            WRITE(3,1012) ITT
00175            IF(ITT .GT. NIT) GO TO 460
00176    C
00177    C--------PROCESSING AN INPUT TYPE TABLE
00178            DO 455 I = 1,MAXFLD
00179            DO 455 J = 1,MAXROW
00180            ITEMP(I,J) = ITABLE(ITT,I,J)
00181    455     CONTINUE
00182            GO TO 470
00183    C
00184    C--------PROCESSING AN OUTPUT TYPE TABLE
00185    460     CONTINUE
00186            CALL ROYOUT(ITT,ITEMP)
%FTNDIM LINE:00186 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00187    C
00188    C--------OUTPUT TABLE
00189    470     CONTINUE
00190            CALL LISTO(ITT,ITEMP)
%FTNDIM LINE:00190 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00191    C
00192    C
00193    490     CONTINUE
00194    C
00195    C
00196          WRITE(5,1024)
00197          CALL DLAY(2)
00198          GO TO 100
00199    C
00200    C     RUN BATTLE
00201    C
00202      500 CONTINUE
00203            WRITE(5,1125)
00204            READ(5,1126) IDRUN
00205          WRITE(5,1025)
00206          CALL BATLE
00207          WRITE(5,1026)
00208          CALL DLAY(2)
00209          GO TO 100
00210    C
00211    C     STOP
00212    C
00213      600 CONTINUE
00214          WRITE(5,1027)
00215          CALL RELEAS(23)
00216            RETURN
00217    C
00218    C     LIST TABLES
00219    C
00220      700 CONTINUE
00221          WRITE(5,1028)
00222          WRITE(5,2028)
```

```
00223         WRITE(5,3028)
00224           WRITE(5,1001)
00225         CALL DUMPD
00226         GO TO 100
00227   C
00228   C       FUNCTION EXPLANATION
00229   C
00230     800 CONTINUE
00231         WRITE(5,1029)
00232         WRITE(5,2029)
00233         WRITE(5,3029)
00234           WRITE(5,1001)
00235         CALL DUMPD
00236         GO TO 100
00237   C
00238   C-------FORMATS
00239   1001     FORMAT($,1H0,'TO CONTINUE STRIKE SPACE BAR. ')
00240    1002 FORMAT(72H0TO OPERATE THE OUTCOME CALCULATOR, THE USER REPEATEDLY
00241        1 SELECTS FROM THE/1H ,
00242        228HFOLLOWING LIST OF FUNCTIONS.)
00243    1003 FORMAT (46H THE FOLLOWING FUNCTIONS ARE AVAILABLE TO YOU //1H ,
00244        113H1. LOAD INPUT//1H ,
00245        213H2. SAVE INPUT//1H ,
00246        322H3. DISPLAY/INPUT TABLE//1H ,
00247        414H4. PRINT TABLE//1H ,
00248        56H5. RUN//1H ,
00249        67H6. STOP//1H ,
00250        714H7. LIST TABLES//1H ,
00251        826H8. EXPLAIN ABOVE FUNCTIONS//)
00252    1006 FORMAT (1PH FUNCTION ABORTED.)
00253    1008 FORMAT(71H TO SUPRESS THE FOLLOWING TEXT, CALL FOR THIS FUNCTION W
00254        1ITH A "-3" NEXT/1H ,
00255        25HTIME./1H ,
00256        358H  ONLY TABLES NUMBERED 1-14 CAN BE INITIALIZED OR CHANGED./1H ,
00257        471H  IF A TABLE IS INITIALIZED OR CHANGED, IT IS CHECKED FOR ENTRY
00258        5 ERRORS./1H ,
00259        625H  IF NO ERRORS ARE FOUND /1H ,
00260        765H     1. THE CURRENT DATA TABLE IS REVISED TO REFLECT THE CHANGE
00261        8S.)
00262    1009 FORMAT('0TO REINITIALIZE A TABLE, LEAVE EDITING MODE '/
00263        1   ' IMMEDIATELY AFTER TABLE IS DISPLAYED.'/
00264        2 ' THE USER IS THEN RETURNED TO THE FUNCTION MENU.'//
00265        3' TABLE CUES: 1-ELMTS 2-BFU 3-RFU 4-BENG 5-RENG 6-WPAV 7-ACCAP'/
00266        4' 8-BCPLX 9-RCPLX 10-MISC 11-BOPS 12-ROPS 13-POSIT 14-WX'/
00267        5' 15-BMAC 16-RMAC 17-BATT 18-RATT 19-ACEXP'/)
00268    1010 FORMAT(73H CURRENT TABLE OF INTEREST WAS FOUND TO BE ERROR FREE. I
00269        1T NOW CONSTITUTES/1H ,
00270        229HTHE CURRENT INPUT DATA TABLE./ )
00271    1011 FORMAT('1     LISTING OF SOC PROGRAM TABLES.',5X,A10,5X,A5)
00272    1012 FORMAT(///,1X,'TABLE NUMBER ',I2,/)
00273    1023 FORMAT (51H YOU MAY NOW SELECT ANY TABLE FOR PRINTING OFFLINE./
00274        +1H ,
00275        145HADDITIONALLY,WHEN ASKED FOR THE TABLE NUMBER /1H ,
00276        262H     A RESPONSE OF 98 WILL GIVE ALL OF THE INPUT TABLES(1-14)./
00277        +1H ,
00278        364H     A RESPONSE OF 99 WILL GIVE ALL OF THE OUTPUT TABLES(15-19)
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00279        4./'      A RESPONSE OF 100 WILL GIVE ALL OF THE TABLES(1-19).'/)
00280     1024 FORMAT (27H0OFFLINE PRINTING EXECUTED.)
00281     1025 FORMAT (27HOTHE OUTCOME CALCULATOR IS EXECUTING.)
00282     1026 FORMAT(61H0OUTCOME CALCULATIONS FOR CURRENT INPUT DATA TABLES COMP
00283         1LETE.)
00284     1027 FORMAT (31H OUTCOME CALCULATOR TERMINATED.)
00285     1028 FORMAT (42H                                TABLE  DIRECTORY/
00286         156H NO.          TITLE                                    TYPE/
00287         256H  1  FORCE ELEMENTS                                   INPUT/
00288         356H  2  BLUE FORCE UNITS                                INPUT/
00289         456H  3  RED FORCE UNITS                                 INPUT/
00290         556H  4  ENGAGEMENT STATISTICS FOR BLUE ATTACKING RED    INPUT/
00291         656H  5  ENGAGEMENT STATISTICS FOR RED ATTACKING BLUE    INPUT/
00292         756H  6  WEAPON PLATFORM AVAILABILITY                    INPUT)
00293     1029 FORMAT (42H                          FUNCTION EXPLANATIONS/1H ,/1H ,
00294         1o8H1. LOAD INPUT - INPUT DATA TABLES WILL BE ENTERED FROM A PREVIO
00295         2USLY /1H ,
00296         337H                CONSTRUCTED DATA SET./1H ,/1H ,
00297         471H2. SAVE INPUT - CURRENT INPUT DATA TABLES WILL BE SAVED FOR FUT
00298         5URE USE./1H ,/1H ,
00299         672H3. DISPLAY/INPUT - SUBSEQUENTLY SELECTED TABLE WILL BE DISPLAYE
00300         7D. IF THE/1H ,
00301         871H       TABLE       TABLE IS IN THE INPUT DATA SET IT CAN BE INI
00302         9TIALIZED)
00303     1057 FORMAT($,46H0WHAT FUNCTION NUMBER DO YOU WISH TO EXECUTE? )
00304     1061 FORMAT($,42H WHAT TABLE DO YOU WISH TO DISPLAY/INPUT? )
00305     1063 FORMAT($,41H WHAT TABLE NUMBER DO YOU WISH TO PRINT? )
00306     1125    FORMAT(' WHAT IS THE RUN ID (10 CHAR MAX)? ')
00307     1126    FORMAT(A10)
00308     2008 FORMAT (51H      2. THE USER IS RETURNED TO THE FUNCTION MENU.//
00309         11H ,23H  IF AN ERROR IS FOUND /1H ,
00310         269H      1. THE TABLE IS DISPLAYED AGAIN FOR CORRECTION(BAD FIELDS
00311         3 NOTED)/1H ,
00312         449H      2. NO ACTION IS TAKEN ON CURRENT DATA TABLE.)
00313     2023 FORMAT(56H  7  CAPABILITIES OF A/C RELATED ELEMENTS          INPUT
00314         1/
00315         256H  8  BLUE FORCE COMPLEXES                             INPUT/
00316         356H  9  RED FORCE COMPLEXES                              INPUT/
00317         456H 10  MISCELLANEOUS INPUT                              INPUT/
00318         556H 11  BLUE OPERATIONS PLANS                           INPUT/
00319         656H 12  RED OPERATIONS PLANS                            INPUT/
00320         756H 13  RELATIVE COMPLEX POSITIONS                      INPUT/
00321         856H 14  INITIATING WX DAYS                              INPUT)
00322     2029 FORMAT (30H                        OR EDITED./1H ,/1H ,
00323         169H4. PRINT TABLE - SUBSEQUENTLY SELECTED TABLE WILL BE PRINTED OF
00324         2FLINE.//1H ,
00325         369H5. RUN - CURRENT INPUT DATA TABLES WILL BE USED TO GENERATE OUT
00326         4COMES.//1H ,
00327         548H6. STOP - OUTCOME CALCULATOR WILL BE TERMINATED./)
00328     3023 FORMAT(57H 15  BLUE MISSION ACCOMPLISHMENT RESULTS          OUTPU
00329         1T/
00330         257H 16  RED MISSION ACCOMPLISHMENT RESULTS              OUTPUT/
00331         357H 17  BLUE COMPLEX BATTLE ATTRITION RESULTS           OUTPUT/
00332         457H 18  RED COMPLEX BATTLE ATTRITION RESULTS            OUTPUT/
00333         557H 19  AIRCRAFT EXPENDITURE SUMMARY                    OUTPUT/)
00334     3029 FORMAT(68H 7. LIST TABLES - REFERENCE NUMBERS AND TITLES OF TABLES
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00335          1 USED BY THE/1H ,
00336          254H                    OUTCOME CALCULATOR WILL BF DISPLAYED.//)
00337           END
```

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00001
00002           SUBROUTINE BATLE
00003    C
00004    C      THIS ROUTINE CONTROLS THE OUTCOME COMPUTATION ALGORITHM
00005    C
00006           CALL NEWRUN(IEND,IDAY)
00007       200 CALL NEWDAY(IEND,IDAY)
00008           IF(IEND.EQ.1) RETURN
00009           DO 400 ITS=1,8
00010           CALL SCHED(IDAY,ITS)
%FTNDIM LINE:00010 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00011           CALL RECOVR
00012              CALL LAUNCH(ITS, IDAY)
%FTNDIM LINE:00012 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00013           CALL ENGAGE(IDAY)
00014           CALL RECOVR
00015       400 CONTINUE
00016           GO TO 200
00017           END
```

```
00001
00002         SUBROUTINE NEWRUN(IEND,IDAY)
00003    C
00004    C     THIS ROUTINE INITIALIZES AN OUTCOME COMPUTATION
00005    C
00006         DOUBLE PRECISION DCOMPS,DPLFX,ORIG,TARG,TTS
00007         REAL LRDEF
00008         INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00009         INTEGER MASK,UGOT
00010         REAL LIVPLX
00011         COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00012        +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00013        +DCOMPS(2,10),MAXR(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00014        +DRMAX(2,20),SPEED(2,20),TRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00015        +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00016         COMMON/BLOCKC/COMPLX(2,10,10),
00017        +DPLFX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLF(2,10),
00018        +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00019        +NPLFX(2),MTIME(2),         NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00020        +OPSLCH,OPSLND
00021         COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00022        +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00023        +RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),ORIG(2,20),
00024        +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00025        +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00026        +DAY(30), WX(30),IWX(30),NMISS(2)
00027         COMMON/BLOCKE/LIVPLX(2,10,10),MASK(2,20,3),UGOT(2,20,3),
00028        +SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,8),ADBASE(2,10)
00029            COMMON /AIREXP/ EXPS(19,10)
00030         IDAY=0
00031         IEND=0
00032    C
00033    C     SET UP FLAGS TO INDICATE START AND STOP CRITERIA FOR MISSIONS
00034    C     N=1 FOR START
00035    C      N=2 FOR STOP
00036    C
00037         DO 490 L=1,2
00038         NM=NMISS(L)
00039         DO 485 M=1,NM
00040         IONOFF(L,M,1)=0
00041         IONOFF(L,M,2)=0
00042         DO 480 N=1,2
00043         SA(L,M,N)=S1(L,M,N)
00044         SB(L,M,N)=S2(L,M,N)
00045         IF(S1(L,M,N).NE. 3HDAY) GO TO 350
00046         DECODE(10,1000,S2(L,M,N)) A
00047         IS=A+.5
00048         IF(N.EQ.1) START(L,M)=IS
00049         IF(N.EQ.2) STOP(L,M)=IS
00050         GO TO 480
00051     350 IF(S1(L,M,N).NE. 3HEND) GO TO 450
00052         DO 440 J=1,NM
00053         IF(S2(L,M,N).NE.DMISS(L,J)) GO TO 440
00054         IONOFF(L,M,N)=1
00055         JONOFF(L,M,N)=J
00056         IF(N.EQ.1) START(L,M)=100
```

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00057          IF(N.EQ.2) STOP(L,M)=100
00058          GO TO 480
00059      440 CONTINUE
00060      450 IF(S1(L,M,N).EQ.3H    ) GO TO 475
00061          DECODE(10,1000,S2(L,M,N)) A
00062          IPERCT=A+.5
00063     1000 FORMAT(F5.0,5X)
00064          IF(S1(L,M,N).EQ. 3HDOA) IA=2
00065          IF(S1(L,M,N).EQ. 3HDDA) IA=3
00066          IF(S1(L,M,N).EQ. 3HDOS) IA=4
00067          IF(S1(L,M,N).EQ. 3HDDS) IA=5
00068          IF(S1(L,M,N).EQ. 3HDLS) IA=6
00069          IONOFF(L,M,N)=IA
00070          JONOFF(L,M,N)=IPERCT
00071      475 IF(N.EQ.1) START(L,M)=100
00072          IF(N.EQ.2) STOP(L,M)=100
00073      480 CONTINUE
00074      485 CONTINUE
00075      490 CONTINUE
00076    C
00077    C      VARIABLE EXPLANATIONS
00078    C        NMISS=NO. OF MISSIONS  L=1 FOR BLUE  L=2 FOR RED
00079    C        NPLEX=NO. OF COMPLEXES
00080    C        NCOMPS=NO. OF FORCE COMPONENTS
00081    C        UASK=CUM NO. OF FORCE UNITS REQUESTED FOR M-TH MISSION
00082    C        UGOT=CUM NO. OF RECEIVED UNITS
00083    C        LIVPLX=NO. OF LIVE TYPE I UNITS AT K-TH COMPLEX
00084    C        ADBASE=CUM NO. OF OPERATIONS REPAIRED AT K-TH COMPLEX
00085    C        AIRON=AVAIL. OF FORCE UNITS ON GROUND
00086    C             J INDICATES TIME STEP(1=CURRENT)
00087    C        AIRUP=STATUS OF UNITS OUT ON MISSIONS
00088    C
00089          DO 650 L=1,2
00090          NM=NMISS(L)
00091          NP=NPLEX(L)
00092          NC=NCOMPS(L)
00093          DO 500 M=1,NM
00094          DO 500 N=1,3
00095          UASK(L,M,N)=0
00096          UGOT(L,M,N)=0
00097      500 CONTINUE
00098          DO 600 K=1,NP
00099          ADBASE(L,K)=0.0
00100          DO 600 I=1,NC
00101          LIVPLX(L,K,I)=COMPLX(L,K,I)
00102          IF(I.LE.5) SR30(L,K,I)=0.0
00103      600 CONTINUE
00104      650 CONTINUE
00105          N=0
00106          DO 700 L=1,2
00107          NP=NPLEX(L)
00108          DO 700 K=1,NP
00109          N=N+1
00110          DO 700 I=1,5
00111          DO 700 J=1,8
00112          AIRON(N,I,J)=0.0
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```
00113          IF(J.EQ.1) AIRDN(N,I,J)=LIVPLX(L,K,I)
00114          IF(L.EQ.1.AND.J.EQ.1) AIRDN(N,5,J)=0.0
00115          AIRUP(N,I,J)=0.0
00116      700 CONTINUE
00117               DO 900 I=1,10
00118               DO 800 J=1,19
00119               EXPS(J,I)=0.0
00120    800        CONTINUE
00121          RETURN
00122          END
```

```
00001
00002           SUBROUTINE NEWDAY(IEND,IDAY)
00003     C
00004     C     THIS ROUTINE INITIALIZES A NEW DAY IN THE ENGAGEMENT
00005     C
00006           DOUBLE PRECISION DCOMPS,DPLEX,ORIG,TARG,TTS
00007           REAL LRDEF
00008           INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00009           INTEGER UASK,UGOT
00010           REAL LIVPLX
00011           DIMENSION D(10,6),XNTGER(31)
00012             COMMON/MODS/IDRUN,JDAY
00013             DOUBLE PRECISION IDRUN
00014             COMMON/ENDC/JENDC
00015           COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00016          +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00017          +DCOMPS(2,10),MAXR(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00018          +DRMAX(2,20),SPEED(2,20),IRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00019          +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00020           COMMON/BLOCKC/COMPLX(2,10,10),
00021          +DPLEX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLE(2,10),
00022          +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00023          +NPLEX(2),MTIME(2),         NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00024          +OPSLCH,OPSLND
00025           COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00026          +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00027          +RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),ORIG(2,20),
00028          +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00029          +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00030          +DAY(30), WX(30),IWX(30),NMISS(2)
00031           COMMON/BLOCKE/LIVPLX(2,10,10),UASK(2,20,3),UGOT(2,20,3),
00032          +SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,8),ADBASE(2,10)
00033           COMMON/BLOCKF/SR(2,10,5),IPTY(2,9)
00034           COMMON /AIREXP/ EXPS(10,10)
00035           DATA XNTGER/5H    0,
00036          +5H    1 ,5H    2 ,5H    3 ,5H    4 ,5H    5 ,
00037          +            5H    6 ,5H    7 ,5H    8 ,5H    9 ,5H   10 ,
00038          +            5H   11 ,5H   12 ,5H   13 ,5H   14 ,5H   15 ,
00039          +            5H   16 ,5H   17 ,5H   18 ,5H   19 ,5H   20 ,
00040          +            5H   21 ,5H   22 ,5H   23 ,5H   24 ,5H   25 ,
00041          +            5H   26 ,5H   27 ,5H   28 ,5H   29 ,5H   30 /
00042     C
00043     C     INITIALIZE VARIABLES AT THE BEGINNING OF A NEW DAY
00044     C
00045             JDAY=IDAY
00046           IDAY=IDAY+1
00047           DO 500 L=1,2
00048           NP=NPLEX(L)
00049           DO 150 IK=1,9
00050           IPTY(L,IK)=0
00051       150 CONTINUE
00052           DO 330 K=1,NP
00053           DO 200 I=1,6
00054           IF(I.LE.5) SR(L,K,I)=0.0
00055           D(K,I)=0.0
00056       200 CONTINUE
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```
00057   C
00058   C           COMPUTE DESTRUCTION LEVEL AT EACH COMPLEX FOR EACH ELEMENT CL
00059   C             D=FRACTION OF UNITS I AT K DESTROYED
00060   C             I=(1 FOR DA,3 DA,4 DS,5 DS,6 LS)
00061   C
00062               IF(L.EQ.2) GO TO 300
00063               XN=LIVPLX(L,K,1)+LIVPLX(L,K,2)
00064               XD=COMPLX(L,K,1)+COMPLX(L,K,2)
00065               IF(XD.GT..001)D(K,2)=1.-XN/XD
00066               XN=LIVPLX(L,K,3)+LIVPLX(L,K,4)
00067               XD=COMPLX(L,K,3)+COMPLX(L,K,4)
00068               IF(XD.GT..001)D(K,3)=1.-XN/XD
00069               IF(COMPLX(L,K,5).GT..001)D(K,4)=1.-LIVPLX(L,K,5)/
00070         1           COMPLX(L,K,5)
00071               IF(COMPLX(L,K,6).GT..001)D(K,5)=1.-LIVPLX(L,K,6)/
00072         1           COMPLX(L,K,6)
00073               GO TO 330
00074   300         CONTINUE
00075               XN=LIVPLX(L,K,1)+LIVPLX(L,K,2)+LIVPLX(L,K,3)
00076               XD=COMPLX(L,K,1)+COMPLX(L,K,2)+COMPLX(L,K,3)
00077               IF(XD.GT..001)D(K,2)=1.-XN/XD
00078               IF(COMPLX(L,K,4).GT..001)D(K,3)=1.-LIVPLX(L,K,4)/
00079         1           COMPLX(L,K,4)
00080               XN=LIVPLX(L,K,5)+LIVPLX(L,K,6)
00081               XD=COMPLX(L,K,5)+COMPLX(L,K,6)
00082               IF(XN.GT..001)D(K,4)=1.-XN/XD
00083               IF(COMPLX(L,K,7).GT..001)D(K,5)=1.-LIVPLX(L,K,7)/
00084         1           COMPLX(L,K,7)
00085               IF(COMPLX(L,K,8).GT..001)D(K,6)=1.-LIVPLX(L,K,8)/
00086         1           COMPLX(L,K,8)
00087     330 CONTINUE
00088   C
00089   C      UPDATE START AND STOP IN OPERATIONS PLAN
00090   C
00091          J=2
00092          IF(L.EQ.2) J=1
00093          NM=NMISS(J)
00094          DO 450 ITP=1,2
00095          DO 400 M=1,NM
00096          DO 350 N=1,2
00097          IST=0
00098          IF(N.EQ.1) S=START(J,M)
00099          IF(N.EQ.2) S=STOP(J,M)
00100          IO= IONOFF(J,M,N)
00101          JO= JONOFF(J,M,N)
00102   C
00103   C     CHECK FOR DAY SPECIFICATION
00104   C
00105          IF(IO .EQ.0) GO TO 350
00106          IF(IO.NE.1) GO TO 340
00107          IF(STOP(J,JO).GT.99) GO TO 350
00108   C
00109   C    START/STOP CRITERIA IN TERMS OF END MISSION
00110   C
00111          IONOFF(J,M,N)=0
00112          SA(J,M,N)=3HDAY
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```
00113          IS=STOP(J,JO)+2-N
00114          IF(N.EQ.1) START(J,M)=IS
00115          IF(N.EQ.2) STOP(J,M)=IS
00116          SB(J,M,N)=XNTGER(IS+1)
00117          GO TO 350
00118    C
00119    C      START/STOP DEPENDS ON DESTRUCTION LEVEL
00120    C
00121      340 JT=TARGET(J,M)
00122          AO=JONOFF(J,M,N)/100.
00123          IF( S.GT.99.AND. D(JT,IO).GE.AO) IST=1
00124          IF(IST.EQ.0) GO TO 350
00125          IONOFF(J,M,N)=0
00126          IS=IDAY+1-N
00127          IF(N.EQ.1) START(J,M)=IS
00128          IF(N.EQ.2)  STOP(J,M)=IS
00129          SA(J,M,N)=3HDAY
00130          SB(J,M,N)=XNTGER(IS+1)
00131      350 CONTINUE
00132      400 CONTINUE
00133      450 CONTINUE
00134      500 CONTINUE
00135    C
00136    C      CHECK TO SEE IF EITHER SIDE HAS COMPLETED ALL OFFENSIVE MISSIONS
00137    C
00138    C       VARIABLES ARE
00139    C            IDAY=CURRENT DAY
00140    C            NDAYS=MAX DAYS
00141    C            IDEF=FLAG FOR DEFENSE MISSION
00142    C            JENDC=FLAG TO CONTINUE EVEN IF ONLY DEFENSE LEFT
00143          IEND=1
00144          IF(IDAY.GT.NDAYS)  GO TO 800
00145          DO 700 L=1,2
00146          NM=NMISS(L)
00147          DO 650 M=1,NM
00148          IDEF=0
00149          IF(UNIT(L,M,1).EQ.5HSUCAP.OR.UNIT(L,M,1).EQ.5HVFCAP.OR.UNIT(L,M,1)
00150         +.EQ.5HDLI  .OR.UNIT(L,M,1).EQ.5HSLI  ) IDEF=1
00151          IF(IDAY.GT.STOP(L,M).OR.IPRI(L,M).EQ.0) GO TO 650
00152            IF(IDEF.EQ.1.AND.JENDC.EQ.0) GO TO 650
00153          GO TO 700
00154      650 CONTINUE
00155          GO TO 800
00156      700 CONTINUE
00157          IEND=0
00158          RETURN
00159    C
00160    C       TERMINATE BATTLE
00161    C
00162      800 DO 900 L=1,2
00163          NP=NPLEY(L)
00164          NC=NCOMPS(L)
00165          DO 900 K=1,NP
00166          DO 850 I=1,NC
00167          LIVPLY(L,K,I)=COMPLY(L,K,I)-LIVPLY(L,K,I)
00168      850 CONTINUE
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00169      900 CONTINUE
00170          IF(JDAY.EQ.1) GO TO 983
00171          DO 982 I=2,JDAY
00172          DO 982 J=1,19
00173          EXPS(J,I)=EXPS(J,I)+EXPS(J,I-1)
00174      982 CONTINUE
00175      983 CONTINUE
00176          RETURN
00177          END
```

```
00001
00002          SUBROUTINE SCHED(IDAY,ITS)
00003    C
00004    C     THIS ROUTINE SETS UP THE MISSION SCHEDULE FOR THE DAY
00005    C
00006          REAL LRDEF
00007          DOUBLE PRECISION DCOMPS,DPLEX,ORIG,TARG,TTS
00008          INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00009          INTEGER UASK,UGOT
00010          REAL LIVPLX,NOPS
00011          DIMENSION SRT(2,10,5),SR30T(2,10,5),A(5),JRPLEN(2,10)
00012          COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00013         +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00014         +DCOMPS(2,10),MAXR(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00015         +DRMAX(2,20),SPEED(2,20),IRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00016         +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00017          COMMON/BLOCKC/COMPLX(2,10,10),
00018         +DPLEX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLE(2,10),
00019         +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00020         +NPLEX(2),MTIME(2),        NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00021         +OPSLCH,OPSLND
00022          COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00023         +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00024         +RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),ORIG(2,20),
00025         +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00026         +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00027         +DAY(30), WX(30),IWX(30),NMISS(2)
00028          COMMON/BLOCKE/LIVPLX(2,10,10),UASK(2,20,3),UGOT(2,20,3),
00029         +SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,8),ADBASE(2,10)
00030          COMMON/BLOCKF/SR(2,10,5),IPTY(2,9)
00031          COMMON/BLOCKH/ISCHED(2,20,8),IU(2,20),JU(2,20),NOPS(2,10)
00032    C
00033          IF(ITS.NE.1) GO TO 350
00034    C
00035    C     DETERMINE WHICH COMPLEXES ARE IN REPLENISHMENT
00036    C
00037          DO 150 L=1,2
00038          NP=NPLEX(L)
00039          DO 100 K=1,NP
00040          JRPLEN(L,K)=0
00041          IF(ICYCLE(L,K).LE.0) GO TO 100
00042          J=(IDAY-1)/ICYCLE(L,K)
00043          JJ=IDAY-J*ICYCLE(L,K)
00044          JL=ICYCLE(L,K)-JJ
00045          IF(JL.GE.IREPL(L,K)) GO TO 100
00046          JRPLEN(L,K)=1
00047      100 CONTINUE
00048      150 CONTINUE
00049    C
00050    C     CONSTRUCT TODAYS MISSION SCHEDULE
00051    C
00052          DO 300 L=1,2
00053          NM=NMISS(L)
00054          DO 250 M=1,NM
00055          DO 200 KK=1,8
00056    C
```

```
00057   C      ISCHED=0 IF NO MISSION ELSE PRIORITY OF MISSION
00058   C           M=MISSION NO.
00059   C           KK=TIME STEP
00060   C
00061          ISCHED(L,M,KK)=0
00062     200  CONTINUE
00063   C
00064   C       MISSION SCHEDULER FILTER
00065   C
00066          IF(IDAY.LT.START(L,M).OR.IDAY.GT.STOP(L,M).OR.UMAX(L,M).LT.1.OR.
00067         +IPRI(L,M).LT.1) GO TO 250
00068          I1=ORIGIN(L,M)
00069          I2=TARGET(L,M)
00070          IUN=IUNIT(L,M)
00071          IUN1=IUN
00072          IDEF=0
00073          IF(UNIT(L,M,1).EQ.5HSUCAP.OR.UNIT(L,M,1).EQ.5HVFCAP.OR.UNIT(L,M,1)
00074         +.EQ.5HDLI  .OR.UNIT(L,M,1).EQ.5HSLI  ) IDEF=1
00075   C
00076   C      IF ORIGIN IN REPLENISHMENT AND "D" no offense scheduled
00077   C
00078          IF(JRPLEN(L,I1).EQ.1.AND.REPOPS(L,I1,2).EQ.1HD.AND.
00079         +IDEF.EQ.0) GO TO 250
00080   C
00081   C       SCHEDULER WILL GET WX OR RANGE DEFAULTS AS NEEDED AND AVAIL
00082   C              IW=1 FOR BAD ELSE 2 FOR GOOD
00083   C              IR=1 FOR LONG ELSE 2 FOR SHORT
00084   C         DEFENSE MISSIONS DO NOT LOOK AT RANGE
00085   C         N=1 FOR NORMAL UNIT
00086   C         N=2 FOR BAD WX DEFAULT
00087   C         N=3 FOR LONG RANGE DEFAULT
00088   C
00089          N=1
00090          IW=IWX(IDAY)
00091          IR=2
00092          IF(L.EQ.1.AND.I2.GT.0) IR=IRANGE(I1,I2)
00093          IF(L.EQ.2.AND.I2.GT.0) IR=IRANGE(I2,I1)
00094          IF(IW.GE.IWSTWX(L,IUN)) GO TO 210
00095          IF(IBWDEF(L,IUN).EQ.0.OR.JWXDEF.EQ.0) GO TO 250
00096          IUN1=IBWDEF(L,IUN)
00097          N=2
00098     210  IF(IR.GE.IMAXR(L,IUN1).OR.IDEF.EQ.1) GO TO 230
00099          IF(ILRDEF(L,IUN) .EQ.0.OR.JLRDEF.EQ.0) GO TO 250
00100          IUN1=ILRDEF(L,IUN)
00101          N=3
00102          IF(IW.LT.IWSTWX(L,IUN1)) GO TO 250
00103     230  IU(L,M)=IUN1
00104          JU(L,M)=N
00105          IP=IPRI(L,M)
00106          IPTY(L,IP)=1
00107          DO 240 K=1,8
00108          IT=MTS(L,M,K)
00109          IF(IT.EQ.0) GO TO 240
00110   C
00111   C      SCHEDULE MISSION      MASK=DESIRED PLUS READY
00112   C
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```
00113          ISCHED(L,M,IT)=IPRI(L,M)
00114          UASK(L,M,N)=UASK(L,M,N)+UMAX(L,M)+UREADY(L,M)
00115      240 CONTINUE
00116      250 CONTINUE
00117      300 CONTINUE
00118    C
00119    C     COMPUTE THE NUMBER OF POSSIBLE OPERATIONS AT CV AND AIRBASE ELEMEN
00120    C
00121      350 DO 500 L=1,2
00122          NP=NPLEX(L)
00123          JB=5
00124          IF(L.EQ.2) JB=6
00125          DO 400 K=1,NP
00126          NOPS(L,K)=0.0
00127          IJ=1
00128          IF(COMPLX(L,K,JB).GT.0.001)
00129         +IJ=(COMPLX(L,K,JB)-LIVPLX(L,K,JB))/COMPLX(L,K,JB)*10.0+1.99
00130    C
00131    C     COMPUTE AVAIL OPERATIONS AND ADD IN REPAIRS
00132    C
00133          F=1.0
00134          IF(JRPLEN(L,K).EQ.1) F=REPOPS(L,K,1)/100.
00135          ADD=AMIN1(COMPLX(L,K,JB)-LIVPLX(L,K,JB),REPAIR(L,IJ)*COMPLX(L,K,JB
00136         +))
00137          ADBASE(L,K)=ADBASE(L,K)+ADD
00138          LIVPLX(L,K,JB)=LIVPLX(L,K,JB)+ADD
00139          NOPS(L,K)=OPS(L,IJ)*COMPLX(L,K,JB)*F
00140      400 CONTINUE
00141      500 CONTINUE
00142    C
00143    C     RESCHEDULE UNFILLED PRIORITY 1 AND 2 MISSIONS FROM LAST TIME STEP
00144    C      IF SAME MISSION NOT SCHEDULED
00145    C
00146          IF(ITS.EQ.1) GO TO 535
00147          DO 530 L=1,2
00148          NM=NMISS(L)
00149          DO 520 M=1,NM
00150          IT1=ITS-1
00151          IF(ISCHED(L,M,IT1).EQ.0.OR.ISCHED(L,M,IT1).GT.2) GO TO 520
00152          IF(ISCHED(L,M,ITS).GT.0) GO TO 520
00153          ISCHED(L,M,ITS)=ISCHED(L,M,IT1)
00154      520 CONTINUE
00155      530 CONTINUE
00156    C
00157    C     UPDATE AIRCRAFT STATES
00158    C
00159      535 IC=0
00160          DO 555 L=1,2
00161          NP=NPLEX(L)
00162          DO 550 K=1,NP
00163          IC=IC+1
00164          DO 545 I=1,5
00165          IF(L.EQ.1.AND.I.EQ.5) GO TO 545
00166          AIRDN(IC,1,1)=AIRDN(IC,I,1)+AIRDN(IC,I,2)
00167          AIRUP(IC,I,1)=AIRUP(IC,I,1)+AIRUP(IC,I,2)
00168          DO 540 J=2,7
```

```
00169          AIRDN(IC,I,J)=AIRDN(IC,I,J+1)
00170          AIRUP(IC,I,J)=AIRUP(IC,I,J+1)
00171      540 CONTINUE
00172          AIRDN(IC,I,8)=0.0
00173          AIRUP(IC,I,8)=0.0
00174      545 CONTINUE
00175      550 CONTINUE
00176      555 CONTINUE
00177    C
00178    C      PROJECT SORTIE REQUIREMENTS FORDING FOR PRIORITY 1 AND 2
00179    C       SURGE FOR PRIORITY 1  NEVER EXCEEDING 30 DAY UTILIZATION
00180    C      CANCEL MISSIONS FOR WHICH THERE ARE INSUFFICIENT RESOURCES
00181    C
00182          DO 800 L=1,2
00183          II=4
00184            IF(L.EQ.2) II = 5
00185          NM=NMISS(L)
00186          NP=NPLEX(L)
00187          DO 570 K=1,NP
00188          DO 570 I=1,II
00189          SR30T(L,K,I)=SR30(L,K,I)
00190          SRT(L,K,I)=SR(L,K,I)
00191      570 CONTINUE
00192          DO 700 IP=1,9
00193          IF(IPTY(L,IP).EQ.0) GO TO 700
00194          DO 680 IT=ITS,8
00195          DO 670 M=1,NM
00196          IF(ISCHED(L,M,IT).NE.IP) GO TO 670
00197          IO=ORIGIN(L,M)
00198          IUN=IU(L,M)
00199          DO 660 I=1,II
00200          A(I)=SRT(L,IO,I)
00201          ANEED=(UMAX(L,M)+UREADY(L,M))*SCOMPS(L,IUN,I)
00202          IF(ANEED.LT.0.001) GO TO 660
00203          IF(LIVPLX(L,IO,I).LT.0.001) GO TO 665
00204          A(I)=(ANEED/LIVPLX(L,IO,I))+SRT(L,IO,I)
00205          IF(A(I).GT.SRATE(L,1,I).AND.IP.GT.2) GO TO 665
00206          IF(A(I).GT.SRATE(L,2,I).AND.IP.GT.1) GO TO 665
00207          IF(A(I)+SR30T(L,IO,I).GT.SR30MX(L,I)) GO TO 665
00208      660 CONTINUE
00209          GO TO 666
00210      665 ISCHED(L,M,IT)=0
00211          GO TO 670
00212      666 DO 667 I=1,II
00213          SRT(L,IO,I)=A(I)
00214      667 CONTINUE
00215      670 CONTINUE
00216      680 CONTINUE
00217      700 CONTINUE
00218      800 CONTINUE
00219          RETURN
00220          END
```

```
00001
00002          SUBROUTINE RECOVR
00003    C
00004    C     THIS ROUTINE RECOVERS AIRCRAFT WAITING TO LAND
00005    C
00006          REAL LRDEF
00007          DOUBLE PRECISION DCOMPS,DPLEX,ORIG,TARG,TTS
00008          INTEGER UASK,UGOT
00009          REAL LIVPLX,NOPS
00010          COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00011         +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00012         +DCOMPS(2,10),MAXR(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00013         +DRMAX(2,20),SPEED(2,20),IRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00014         +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00015          COMMON/BLOCKC/COMPLX(2,10,10),
00016         +DPLEX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLE(2,10),
00017         +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00018         +NPLEX(2),MTIME(2),        NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00019         +OPSLCH,OPSLND
00020          COMMON/BLOCKE/LIVPLX(2,10,10),UASK(2,20,3),UGOT(2,20,3),
00021         +SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,8),ADBASE(2,10)
00022          COMMON/BLOCKH/ISCHED(2,20,8),IU(2,20),JU(2,20),NOPS(2,10)
00023    C
00024    C     RECOVER AIRCRAFT WAITING TO LAND
00025    C
00026    C     RECOVERY          RR  TIME          POSSIBLE TAKE OFF
00027    C     BEGINNING            0                 CURRENT
00028    C     BEGINNING            1                    NEXT
00029    C         END            0 OR 1                   NEXT
00030    C
00031    C
00032          DO 500 L=1,2
00033          NP=NPLEX(L)
00034          II=4
00035          DO 400 K=1,NP
00036          ICX=K
00037          IF(L.EQ.2) ICX=NPLEX(1)+K
00038          DO 300 J=1,1000
00039          NJ=0
00040          DO 200 I=1,II
00041          IF(AIRUP(ICX,I,1).LT.0.0001.OR.NOPS(L,K).LT..001) GO TO 200
00042          A=AMIN1(1.0,AIRUP(ICX,I,1),NOPS(L,K)/OPSLND)
00043          NJ=1
00044          NOPS(L,K)=AMAX1(NOPS(L,K)-A*OPSLND,0.)
00045          AIRUP(ICX,I,1) = AIRUP(ICX,I,1)-A
00046          IRR=IRRTIM(L,I)+1
00047            IRR = MINO(IRR,8)
00048          AIRDN(ICX,I,IRR)=AIRDN(ICX,I,IRR)+A
00049      200 CONTINUE
00050          IF(NJ.EQ.0) GO TO 400
00051      300 CONTINUE
00052      400 CONTINUE
00053      500 CONTINUE
00054          RETURN
00055          END
```

```
00001
00002          SUBROUTINE LAUNCH(IT, IDAY)
00003    C
00004    C     THIS ROUTINE LAUNCHES AIRCRAFT TO FILL SCHEDULED MISSIONS
00005    C
00006          REAL LRDEF
00007          DOUBLE PRECISION DCOMPS,DPLEX,ORIG,TARG,TTS
00008          INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00009          INTEGER MASK,UGOT
00010          REAL LIVPLX,NOPS
00011          DIMENSION A(5),ANEED(5)
00012          COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00013         +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00014         +DCOMPS(2,10),MAXR(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00015         +DRMAX(2,20),SPEED(2,20),IRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00016         +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00017          COMMON/BLOCKC/COMPLX(2,10,10),
00018         +DPLEX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLE(2,10),
00019         +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00020         +NPLEX(2),ATIME(2),         NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00021         +OPSLCH,OPSLND
00022          COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00023         +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00024         +RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),ORIG(2,20),
00025         +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00026         +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00027         +DAY(30), WX(30),IWX(30),NMISS(2)
00028          COMMON/BLOCKE/LIVPLX(2,10,10),MASK(2,20,3),UGOT(2,20,3),
00029         +SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,8),ADBASE(2,10)
00030          COMMON/BLOCKF/SR(2,10,5),IPTY(2,9)
00031          COMMON/BLOCKH/ISCHED(2,20,8),IU(2,20),JU(2,20),NOPS(2,10)
00032          COMMON/BLOCKI/NMISUP(2,4),MISUP(2,20,4),NUNUP(2,20,4),IREADY(2,20)
00033             COMMON /AIREXP/ EXPS(19,10)
00034    C
00035    C     NMISUP=NO.OF MISSIONS ENGAGED IN CURRENT PERIOD
00036    C                IN=(1 SUCAP, 2 VFCAP, 3 SLI/DLI, 4 OFFENSIVE)
00037    C     MISUP =MISSION NO. FOR EACH ENGAGED MISSION
00038    C     NUNUP=FORCE UNIT NO. FOR EACH ENGAGED MISSION
00039    C     SR=DAILY SORTIE RATE
00040    C     SR30=30 DAY UTILIZATION BOUND
00041    C     ANEED=NO. OF FORCE UNITS NEEDED TO FILL MISSION
00042    C
00043    C                              MISSION PRIORITY
00044    C SORTIE RATE              1 OR 2              >2
00045    C OF NORMAL                  FILL              FILL
00046    C NORMAL OF SURGE            FILL               NO
00047    C OF SURGE                    NO                NO
00048    C
00049    C 30 DAY UTILIZATION NEVER EXCEEDED
00050    C
00051          DO 500 L=1,2
00052          IT=4
00053          IF(L.EQ.2) IT=5
00054          NM=NMISS(L)
00055          DO 100 IN=1,4
00056          NMISUP(L,IN)=0
```

```
00057     100 CONTINUE
00058         DO 400 IP=1,9
00059         IF(IPTY(L,IP).NE.1) GO TO 400
00060         DO 300 M=1,NM
00061         IF(ISCHED(L,M,IT).NE.IP) GO TO 300
00062         IREADY(L,M)=0
00063         ITHRU=0
00064         IO=ORIGIN(L,M)
00065         ICX=IO
00066         IF(L.EQ.2) ICX=IO+NPLEX(1)
00067         IUN=IU(L,M)
00068         NUN= UMAX(L,M)
00069     180 IF(ITHRU.EQ.1) NUN=UREADY(L,M)
00070         IF(NUN.LE.0) GO TO 300
00071     190 OPNEED=0.0
00072         DO 200 I=1,II
00073         A(I)=SR(L,IO,I)
00074         ANEED(I)=NUN*SCOMPS(L,IUN,I)
00075         IF(ANEED(I).LT.0.001) GO TO 200
00076         OPNEED=OPNEED+ANEED(I)*OPSLCH
00077         IF(UNIT(L,M,1).EQ.5HSSM  ) OPNEED=0.0
00078         IF(ANEED(I).GT.AIRDN(ICX,I,1)) GO TO 250
00079         IF(NOPS(L,IO).LT.OPNEED) GO TO 250
00080         IF(LIVPLX(L,IO,I).LT.0.001) GO TO 250
00081         A(I)= ANEED(I)/LIVPLX(L,IO,I)+SR(L,IO,I)
00082         IF(A(I).GT.SRATE(L,1,I).AND.IP.GT.2) GO TO 250
00083         IF(A(I).GT.SRATE(L,2,I)) GO TO 250
00084         IF(A(I)+SR30(L,IO,I).GT.SR30MX(L,I)) GO TO 250
00085     200 CONTINUE
00086             IF(L.EQ.2) GO TO 208
00087             IEX=-2
00088             DO 204 I=1,4
00089             IEX=IEX+4
00090             EXPS(IEX,IDAY)=EXPS(IEX,IDAY)+NUN*SCOMPS(1,IUN,I)
00091   204       CONTINUE
00092   208       CONTINUE
00093         IF(ITHRU.EQ.0) GO TO 210
00094         IREADY(L,M)=NUN
00095         GO TO 230
00096     210 IN=4
00097         IF(  UNIT(L,M,1).EQ.5HSUCAP ) IN=1
00098         IF(  UNIT(L,M,1).EQ.5HVFCAP ) IN=2
00099         IF(  UNIT(L,M,1).EQ.5HSLI   .OR.   UNIT(L,M,1).EQ.5HDLI    ) IN=3
00100         NMISUP(L,IN)=NMISUP(L,IN)+1
00101         N=NMISUP(L,IN)
00102         MISUP(L,N,IN)=M
00103         NUNSUP(L,N,IN)=NUN
00104         ISCHED(L,M,IT)=0
00105     230 DO 240 I=1,II
00106         SR(L,IO,I)=A(I)
00107         IF(ANEED(I).LT.0.001) GO TO 240
00108         SR30(L,IO,I)=SR30(L,IO,I)+ANEED(I)/LIVPLX(L,IO,I)
00109         AIRDN(ICX,I,1)=AIRDN(ICX,I,1)-ANEED(I)
00110     240 CONTINUE
00111         K=JU(L,M)
00112         UGOT(L,M,K)=UGOT(L,M,K)+NUN
```

```
00113          NOPS(L,IO)=NOPS(L,IO)-OPNEED
00114          ITHRU=ITHRU+1
00115          IF(ITHRU.GT.1) GO TO 300
00116          GO TO 190
00117    C
00118    C     TRY TO FILL WITH LESS UNITS DOWN TO MIN
00119    C
00120       250 NUN=NUN-1
00121          IF(NUN.LE.0) GO TO 300
00122          IF(NUN.LT. UMIN(L,M).AND.ITHRU.EQ.0) GO TO 300
00123          GO TO 190
00124       300 CONTINUE
00125       400 CONTINUE
00126       500 CONTINUE
00127          RETURN
00128          END
```

```
00001
00002           SUBROUTINE ENGAGE(IDAY)
00003   C
00004   C       THIS ROUTINE CONDUCTS THE ENGAGEMENT OF FORCES IN THE SCHEDULED MI
00005   C
00006           REAL LRDEF
00007           DOUBLE PRECISION DCOMPS,DPLEX,ORIG,TARG,TTS
00008           INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00009           INTEGER UASK,UGOT
00010           REAL LIVPLX,NOPS
00011           DIMENSION VF(2),VFKILL(2),AIRGD(5),AIRLOS(5)
00012           COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00013          +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SPATE(2,2,5),
00014          +DCOMPS(2,10),MAXP(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00015          +DRMAX(2,20),SPEED(2,20),IRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00016          +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00017           COMMON/BLOCKC/COMPLX(2,10,10),
00018          +DPLEX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLE(2,10),
00019          +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00020          +NPLEX(2),MTIME(2),         NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00021          +OPSLCH,OPSLND
00022           COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00023          +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00024          +RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),ORIG(2,20),
00025          +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00026          +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00027          +DAY(30), WX(30),IWX(30),NMISS(2)
00028           COMMON/BLOCKE/LIVPLX(2,10,10),UASK(2,20,3),UGOT(2,20,3),
00029          +SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,8),ADBASE(2,10)
00030           COMMON/BLOCKH/ISCHED(2,20,8),IU(2,20),JU(2,20),NOPS(2,10)
00031           COMMON/BLOCKI/NMISUP(2,4),MISUP(2,20,4),NUNUP(2,20,4),IREADY(2,20)
00032              COMMON /AIREXP/ EXPS(19,10)
00033   C
00034   C       SEND IN AN ATTACK
00035   C
00036           DO 900 L=1,2
00037           LL=2
00038           IF(L.EQ.2) LL=1
00039           NM=NMISUP(L,4)
00040           IF(NM.EQ.0) GO TO 800
00041   C
00042   C       SEQUENTIALLY ENGAGE OFFENSIVE MISSIONS   BLUE FIRST
00043   C
00044           DO 700 J=1,NM
00045           M=MISUP(L,J,4)
00046           NUN=NUNUP(L,J,4)
00047           UIN=NUN
00048           UBACK=NUN
00049           IO=ORIGIN(L,M)
00050           IT=TARGET(L,M)
00051           ICO=IO
00052           ICT=NPLEX(1)+IT
00053           IF(L.EQ.2) ICO=NPLEX(1)+IO
00054           IF(L.EQ.2) ICT=IT
00055           IUN=IU(L,M)
00056           IC=0
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00057          IF( L.EQ.1.OR.SCOMPS(L,IUN,5).EQ.0) GO TO 600
00058    C
00059    C     ENGAGE ATTACKING SSM SHIPS WITH SUCAP
00060    C
00061            ITM = IRANGE(IT,IO)
00062            ITM = MTIME(ITM) + 1
00063            ITM = MIN0(ITM,8)
00064            IRR = MIN0(9,IRRTIM(2,5)+1)
00065          N=1
00066          NMD=NMISUP(LL,N)
00067          IF(NMD.EQ.0) GO TO 600
00068      200 ITHRU=0
00069    C
00070    C     ENGAGE SSM ATTACK WITH EACH SUCAP AT TARGET
00071    C           NO CONSTRAINT ON GETTING OFF DECK LIKE DLI/SLI
00072    C     AS IN ALL CASES DO NOT USE MORE THEN IS REQUIRED
00073    C
00074           DO 500 K=1,NMD
00075          MD=MISUP(LL,K,N)
00076          IUD=IU(LL,MD)
00077          NUND=NUNUP(LL,K,N)
00078          JJUD=JU(LL,MD)
00079          IF(ORIGIN(LL,MD).NE.IT.OR.NUND.EQ.0) GO TO 500
00080          IF(AGKILL(LL,IUD,5).LT.0.00001) GO TO 500
00081          INEED=DBACK/AGKILL(LL,IUD,5)+0.999
00082          IF(INEED.LE.0) GO TO 500
00083          IUSED=MIN0(INEED,NUND)
00084          ITHRU=1
00085          NUNUP(LL,K,N)=NUNUP(LL,K,N)-IUSED
00086          IR=MIN0(IUSED,IREADY(LL,MD))
00087          NUNUP(LL,K,N)=NUNUP(LL,K,N)+IR
00088          IREADY(LL,MD)=IREADY(LL,MD)-IR
00089          UIND=IUSED
00090          UPMAX=9999.
00091          F=1.0
00092          IF(IWX(IDAY).EQ.1) F=WXSURV
00093          IF(SPEED(1,IUD).GT.0.0.AND.DTSLI(2,IO).GT.0.0)
00094         +UPMAX=((DRMAX(1,IUD)*SURFAC(2,IO)*F-25.)/SPEED(1,IUD)/12.0-DELAY)
00095         +/DTSLI(2,IO)+1.0
00096          UPMAX=AMAX1(0.0,UPMAX)
00097    C
00098    C     ENGAGE SUCAP WITH AIR AND SURFACE DEFENDERS
00099    C
00100             CALL DEFEND(LL,L,IO,IUD,IUSED,UPMAX,UIND,VF,VFKILL,IDAY)
%FTNDIM LINE:00100 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00101    C
00102    C        LL=DEFENDER  L=ATTACKER   IO=ORIGIN
00103    C
00104    C     ACCOUNT FOR SUCAP LOSSES AND SCHEDULE LANDING OF SURVIVING SUCAP
00105    C
00106          DO 450 II=1,4
00107    C
00108    C           DEFENSE LOSSES ACCOUNTED FOR IN DEFEND
00109    C
00110          ALOST=(IUSED-UIND)*SCOMPS(1,IUD,II)
00111          ALAND=UIND*SCOMPS(1,IUD,II)
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00112          LIVPLX(1,IT,II)=LIVPLX(1,IT,II)-AMIN1(ALOST,LIVPLX(1,IT,II))
00113          AIRUP(ICT,II,ITM)=AIRUP(ICT,II,ITM)+ALAND
00114       450 CONTINUE
00115     C
00116     C      COMPUTE AIR-TO-GROUND KILLS BY SUCAP
00117     C
00118          IF(IC.EQ.0) UIN=UIN-AMIN1(UIN,UIND*AGKILL(1,IUD,5))
00119          UBACK=UBACK-AMIN1(UBACK,UIND*AGKILL(1,IUD,5))
00120     C
00121     C        ACCOUNT FOR DEFENDERS KILLED BY SUCAP
00122     C
00123            LIVPLX(2,IO,3) = LIVPLX(2,IO,3) - VFKILL(1)
00124            LIVPLX(2,IO,4) = LIVPLX(2,IO,4) - VFKILL(2)
00125               EXPS(18,IDAY)=EXPS(18,IDAY)+VFKILL(1)
00126               EXPS(19,IDAY)=EXPS(19,IDAY)+VFKILL(2)
00127            AIRUP(ICO,3,1) = AIRUP(ICO,3,1) + VF(1) - VFKILL(1)
00128            AIRUP(ICO,4,1) = AIRUP(ICO,4,1) + VF(2) - VFKILL(2)
00129          IF(UBACK.LT.0.001) GO TO 550
00130       500 CONTINUE
00131          IC=1
00132          IF(ITHRU.EQ.1) GO TO 700
00133     C
00134     C      ACCOUNT FOR SSM SHIP LOSSES AND SCHEDULE RETURN OF SURVIVING SSM S
00135     C
00136     550    AIRON(ICO,5,IRR)=AIRON(ICO,5,IRR)+UBACK*SCOMPS(2,IUN,5)
00137          LIVPLX(2,IO,5)=LIVPLX(2,IO,5)-(NUN-UBACK)*SCOMPS(2,IUN,5)
00138     C
00139     C      ENGAGE ATTACKING AIRCRAFT AND SSM WITH AIR AND SURFACE DEFENSES
00140     C
00141     C        VFKILL=FIGHTERS LOST DEFENDING
00142     C         TAIRCD=TOTAL A/C ON GROUND
00143     C         TAIRLS=TOTAL A/C LOST (DISTRIBUTE WITH AIRLOS)
00144     C         A/C LOSS RULES
00145     C                   1. IN RR AND LEAST READY
00146     C                   2. READY FOR SLI CAP OR SUCAP
00147     C                   3. SLI/DLI NOT USED IN DEFENSE
00148     C              THESE RULES APPLY TO EACH TYPE A/C WHICH ARE LOST
00149     C              BASED ON RELATIVE NUMBER PRESENT FOR LOSS
00150     C
00151       600 UPMAX=9999.
00152          F=1.0
00153          IF(IWX(IDAY).EQ.1) F=WXSURV
00154          IF(SPEED(L,IUN).GT.0.0.AND.DTSLI(LL,IT).GT.0.0)
00155         +UPMAX=((OPMAX(L,IUN)*SURFAC(LL,IT)*F-25.)/SPEED(L,IUN)/12.0-DELAY)
00156         +/DTSLI(LL,IT)+1.0
00157          UPMAX=AMAX1(0.0,UPMAX)
00158             CALL DEFEND(L,LL,IT,IUN,NUN,UPMAX,UIN,VF,VFKILL,IDAY)
%FTNDIM LINE:00159 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00159     C
00160     C      ACCOUNT FOR AIRCRAFT KILLED IN DEFENSE AND ATTACKERS KILLED
00161     C
00162     C      SCHEDULE LANDING OF SURVIVORS
00163     C
00164          DO 620 I=1,4
00165     C
00166     C           OFFENSIVE LOSSES ACCOUNTED FOR IN DEFEND
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00167   C
00168         LIVPLX(L,IO,I)=LIVPLX(L,IO,I)-(NUN-UIN)*SCOMPS(L,IUN,I)
00169         IC1=IO
00170         IC2=IT
00171         IF(L.EQ.2) IC1=IT
00172         IF(L.EQ.2) IC2=IO
00173         ITM=IRANGE(IC1,IC2)
00174         IL=MIN0(MTIME(ITM),7)
00175         AIRUP(ICO,I,IL+1)=AIRUP(ICO,I,IL+1)+UIN*SCOMPS(L,IUN,I)
00176         IF(I.NE.3.AND.I.NE.4) GO TO 620
00177   C
00178   C           ACCOUNT FOR DEFENSE FIGHTER LOSS
00179   C
00180               IF(LL.EQ.2) GO TO 610
00181               IEX=11
00182               IF(I.EQ.4)IEX=15
00183               EXPS(IEX,IDAY)=EXPS(IEX,IDAY)+VFKILL(I-2)
00184               GO TO 612
00185   610         CONTINUE
00186               IEX=13
00187               IF(I.EQ.4) IEX=19
00188               EXPS(IEX,IDAY)=EXPS(IEX,IDAY)+VFKILL(I-2)
00189   612         CONTINUE
00190         LIVPLX(LL,IT,I)=LIVPLX(LL,IT,I)-VFKILL(I-2)
00191         AIRUP(ICT,I,1)=AIRUP(ICT,I,1)+VF(I-2)-VFKILL(I-2)
00192     620 CONTINUE
00193   C
00194   C     COMPUTE NUMBER OF AIRCRAFT ON THE GROUND
00195   C
00196         TAIRGD=0.0
00197         DO 650 I=1,4
00198         AIRGD(I)=0.0
00199         DO 630 IJ=1,8
00200         AIRGD(I)=AIRGD(I)+AIRUP(ICT,I,IJ)
00201     630 CONTINUE
00202         DO 640 N=1,3
00203         NMD=NMISUP(LL,N)
00204         IF(NMD.EQ.0) GO TO 640
00205         DO 635 K=1,NMD
00206         MD=MISUP(LL,K,N)
00207         IUD=IU(LL,MD)
00208         NUND=NUNUP(LL,K,N)
00209         NNN=0
00210         IF(N.EQ.3) NNN=NUND
00211         IF(ORIGIN(LL,MD).NE.IT.OR.NUND.EQ.0) GO TO 635
00212         AIRGD(I)=AIRGD(I)+SCOMPS(LL,IUD,I)*(NNN+IREADY(LL,MD))
00213     635 CONTINUE
00214     640 CONTINUE
00215         TAIRGD=TAIRGD+AIRGD(I)
00216     650 CONTINUE
00217   C
00218   C     COMPUTE AIR TO GROUND ATTRITION
00219   C
00220         TAIRLS=AMIN1(AGKILL(L,IUN,4)*UIN,TAIRGD*(1.0-DEFAC(LL,IT)))
00221         NC=NCOMPS(LL)
00222               IEX=1
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00223          DO 680 I=1,NC
00224          IF(I.LE.4) GO TO 670
00225          LIVPLX(LL,IT,I)=LIVPLX(LL,IT,I)-AMIN1(LIVPLX(LL,IT,I),
00226         +UIN*AGKILL( L,IUN,I))
00227          GO TO 680
00228      670 AIRLOS(I)=0.0
00229          IF(TAIRGD.GT.0.001)
00230         +AIRLOS(I)=AIRGD(I)/TAIRGD   *TAIPLS
00231                IF(LL.EQ.2) GO TO 675
00232                IEX=IEX+4
00233                GO TO 678
00234      675       CONTINUE
00235                IEX=18
00236                IF(I.EQ.4)IEX=19
00237      678       CONTINUE
00238                EXPS(IEX,IDAY)=EXPS(IEX,IDAY)+
00239           1          AMIN1(LIVPLX(LL,IT,I),AIRLOS(I))
00240          LIVPLX(LL,IT,I)=LIVPLX(LL,IT,I)-AMIN1(LIVPLX(LL,IT,I),AIRLOS(I))
00241        680 CONTINUE
00242      C
00243      C      ACCOUNT FOR PARKED AIRCRAFT ATTRITED
00244      C
00245          DO 695 I=1,4
00246          SUB=AIRLOS(I)
00247          IF(SUB.LT.0.0001) GO TO 695
00248          DO 685 IJ=1,3
00249          JI=9-IJ
00250          A=AMIN1(SUB,AIRDN(ICT,I,JI))
00251          AIRDN(ICT,I,JI)=AIRDN(ICT,I,JI)-A
00252          SUB=SUB-A
00253          IF(SUB.LT.0.0001) GO TO 695
00254        685 CONTINUE
00255          DO 690 NN=1,3
00256          N=4-NN
00257          NMD=NMISUP(LL,N)
00258          IF(NMD.EQ.0) GO TO 690
00259          DO 687 K=1,NMD
00260          MD=MISUP(LL,K,N)
00261          IUD=IU(LL,MD)
00262          IF(ORIGIN(LL,MD).NE.IT) GO TO 687
00263          IF(SCOMPS(LL,IUD,I).LT.0.001) GO TO 687
00264          ISUB=SUB/SCOMPS(LL,IUD,I)+.999
00265          IB=MINO(IREADY(LL,MD),ISUB)
00266          A=AMIN1(SUB,IB*SCOMPS(LL,IUD,I))
00267          SUB=SUB-A
00268          IREADY(LL,MD)=IREADY(LL,MD)-IB
00269          AIRDN(ICT,I,1) =AIRDN(ICT,I,1) +IB*SCOMPS(LL,IUD,I)-A
00270          DO 686 II=1,4
00271          IF(II.EQ.I) GO TO 686
00272          AIRDN(ICT,II,1)=AIRDN(ICT,II,1)+IB*SCOMPS(LL,IUD,II)
00273        685 CONTINUE
00274          IF(SUB.LT.0.0001) GO TO 695
00275        687 CONTINUE
00276        690 CONTINUE
00277          N=3
00278          NMD=NMISUP(LL,N)
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00279          IF(NMD.EQ.0) GO TO 695
00280          DO 694 K=1,NMD
00281          MD=MISUP(LL,K,N)
00282          IUD=IU(LL,MD)
00283          NUND=NUNUP(LL,K,N)
00284          IF(ORIGIN(LL,MD).NE.IT) GO TO 694
00285          IF(SCOMPS(LL,IUD,I).LT.0.001) GO TO 694
00286          ISUB=SUB/SCOMPS(LL,IUD,I)+.999
00287          IB=MIN0(NUND,ISUB)
00288          A=AMIN1(SUB,IB*SCOMPS(LL,IUD,I))
00289          NUNUP(LL,K,N)=NUNUP(LL,K,N)-IB
00290          AIRDN(ICT,I,1)=AIRDN(ICT,I,1)+IB*SCOMPS(LL,IUD,I)-A
00291          SUB=SUB-A
00292          DO 692 II=1,4
00293          IF(II.EQ.I) GO TO 692
00294          AIRDN(ICT,II,1)=AIRDN(ICT,II,1)+IB*SCOMPS(LL,IUD,II)
00295      692 CONTINUE
00296          IF(SUB.LT.0.0001) GO TO 695
00297      694 CONTINUE
00298      695 CONTINUE
00299      700 CONTINUE
00300      800 CONTINUE
00301    C
00302    C     SCHEDULE LANDING OF UNUSED SUCAP AND CAP AND RELEASE SLI AND READY
00303    C
00304          DO 980 L=1,2
00305          DO 950 N=1,3
00306          NM=NMISUP(L,N)
00307          IF(NM.EQ.0) GO TO 950
00308          DO 940 K=1,NM
00309          M=MISUP(L,K,N)
00310          ID=ORIGIN(L,M)
00311          IP=ID
00312          IF(L.EQ.2) IP=NPLEX(1)+ID
00313          IUN=IU(L,M)
00314          NUN=NUNUP(L,K,N)
00315          NNU=0
00316          NND=0
00317          IF(N.EQ.3) NND=NUN
00318          IF(N.NE.3) NNU=NUN
00319          DO 930 I=1,4
00320          AIRDN(IP,I,1)=AIRDN(IP,I,1)+(NND+IREADY(L,M))*SCOMPS(L,IUN,I)
00321          AIRUP(IP,I,1)=AIRUP(IP,I,1)+NNU*SCOMPS(L,IUN,I)
00322      930 CONTINUE
00323      940 CONTINUE
00324      950 CONTINUE
00325      980 CONTINUE
00326          RETURN
00327          END
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00001
00002          SUBROUTINE DEFEND(L,LL,IT,IUN,NUN,UPMAX,UIN,VF,VFKILL,IDAY)
00003    C
00004    C     THIS ROUTINE CONDUCTS THE AIR DEFENSE ENGAGEMENT OF INCOMING ATTAC
00005    C
00006          DOUBLE PRECISION DCOMPS,DPLEX,ORIG,TARG,TTS
00007          REAL LRDEF
00008          INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00009          INTEGER MASK,UGOT
00010          REAL LIVPLX,NOPS
00011          DIMENSION VF(2),VFKILL(2)
00012          COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00013         +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00014         +DCOMPS(2,10),MAXR(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00015         +DRMAX(2,20),SPEED(2,20),IRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00016         +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00017          COMMON/BLOCKC/COMPLX(2,10,10),
00018         +DPLEX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLE(2,10),
00019         +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00020         +NPLEX(2),NTIME(2),         NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00021         +OPSLCH,OPSLND
00022          COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00023         +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00024         +RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),ORIG(2,20),
00025         +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00026         +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00027         +DAY(30), WX(30),IWX(30),NMISS(2)
00028          COMMON/BLOCKE/LIVPLX(2,10,10),MASK(2,20,3),UGOT(2,20,3),
00029         +SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,3),ADBASE(2,10)
00030          COMMON/BLOCKH/ISCHED(2,20,8),IU(2,20),JU(2,20),NOPS(2,10)
00031          COMMON/BLOCKI/NMISUP(2,4),MISUP(2,20,4),NUNUP(2,20,4),IREADY(2,20)
00032             COMMON /AIREXP/ EXPS(19,10)
00033    C
00034    C     UIN=UPDATED COUNT OF SURVIVING ATTACKING UNITS
00035    C     AA=NO. OF ATTACKING UNITS THAT CAN BE KILLED PER DEFENSE UNIT(AIR
00036    C     IUSED=NO. OF DEFENSIVE UNITS ENGAGED
00037    C
00038          VF(1)=0.0
00039          VF(2)=0.0
00040          VFKILL(1)=0.0
00041          VFKILL(2)=0.0
00042          IC=0
00043      100 ITHRU=0
00044          DO 600 N=2,3
00045          NMD=NMISUP(LL,N)
00046          IF(NMD.EQ.0) GO TO 550
00047          DO 500 K=1,NMD
00048          IF(UIN.LT.0.0001) GO TO 700
00049          MD=MISUP(LL,K,N)
00050          IUD=IU(LL,MD)
00051          NUND=NUNUP(LL,K,N)
00052          JJUD=JU(LL,MD)
00053          IUMAX=NUND
00054          IF(IC.EQ.0) GO TO 450
00055          AIR=0.0
00056          DO 400 II=1,4
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00057          AIR=AIR+SCOMPS(LL,IUD,II)
00058      400 CONTINUE
00059          IUMAX=UPMAX/AIR
00060      450 IF(ORIGIN(LL,MD).NE.IT.OR.NUND.EQ.0.OR.IUMAX.LE.0) GO TO 500
00061          AA=SCOMPS(LL,IUD,3)*STRAT(L,IUN,1)+SCOMPS(LL,IUD,4)*STRAT(L,IUN,2)
00062          IF(AA.LT.0.000001) GO TO 500
00063          INEED=UIN/AA+0.99
00064          IF(INEED.LE.0) GO TO 500
00065          IUSED=MINO(INEED,NUND,IUMAX)
00066          IF(IC.EQ.1) UPMAX=UPMAX-IUSED*AIR
00067          ITHRU=1
00068          NUNUP(LL,K,N)=NUNUP(LL,K,N)-IUSED
00069          IR=MINO(IUSED,IREADY(LL,MD))
00070          NUNUP(LL,K,N)=NUNUP(LL,K,N)+IR
00071          IREADY(LL,MD)=IREADY(LL,MD)-IR
00072              AALOSS=UIN
00073          UIN=UIN-AMIN1(AA*IUSED,UIN)
00074              AALOSS=AALOSS-UIN
00075               IEX=-1
00076               DO 455 III=1,4
00077               IEX=IEX+4
00078               IF(L.EQ.2) IEX=18
00079               IF(L.EQ.2 .AND. III.EQ.4)IEX=19
00080               EXPS(IEX,IDAY)=EXPS(IEX,IDAY)+AALOSS*SCOMPS(L,IUN,III)
00081  455          CONTINUE
00082          VF(1)=VF(1)+SCOMPS(LL,IUD,3)*IUSED
00083          VF(2)=VF(2)+SCOMPS(LL,IUD,4)*IUSED
00084          IF(UIN.LT.0.0001) GO TO 700
00085      500 CONTINUE
00086      550 IC=1
00087      600 CONTINUE
00088          IF(ITHRU.EQ.1) GO TO 100
00089  C
00090  C      COMPUTE SURFACE-TO-AIR LOSSES
00091  C
00092      700 I1=5
00093          I2=6
00094          IF(LL.EQ.2) I1=7
00095          IF(LL.EQ.2) I2=8
00096              GALOSS=UIN
00097          UIN=UIN-AMIN1(UIN,STRAT(L,IUN,3)*LIVPLX(LL,IT,I1))
00098          UIN=UIN-AMIN1(UIN,STRAT(L,IUN,4)*LIVPLX(LL,IT,I2))
00099              GALOSS=GALOSS-UIN
00100              IEX=0
00101              DO 705 III=1,4
00102              IEX=IEX+4
00103              IF(L.EQ.2) IEX=18
00104              IF(L.EQ.2 .AND. III.EQ.4)IEX=19
00105              EXPS(IEX,IDAY)=EXPS(IEX,IDAY)+
00106         1           GALOSS*SCOMPS(L,IUN,III)
00107  705         CONTINUE
00108          IF((VF(1)+VF(2)).LT.0.001) RETURN
00109  C
00110  C      COMPUTE AIR TO AIR LOSS OF DEFENDERS
00111  C
00112          VFKILL(1)=AMIN1(VF(1),VF(1)/(VF(1)+VF(2))*ADEFAT(L,IUN,1)*NUN)
```

```
00113           VFKILL(2)=AMIN1(VF(2),VF(2)/(VF(1)+VF(2))*ADEFAT(L,IUN,2)*NUN)
00114           RETURN
00115           END
```

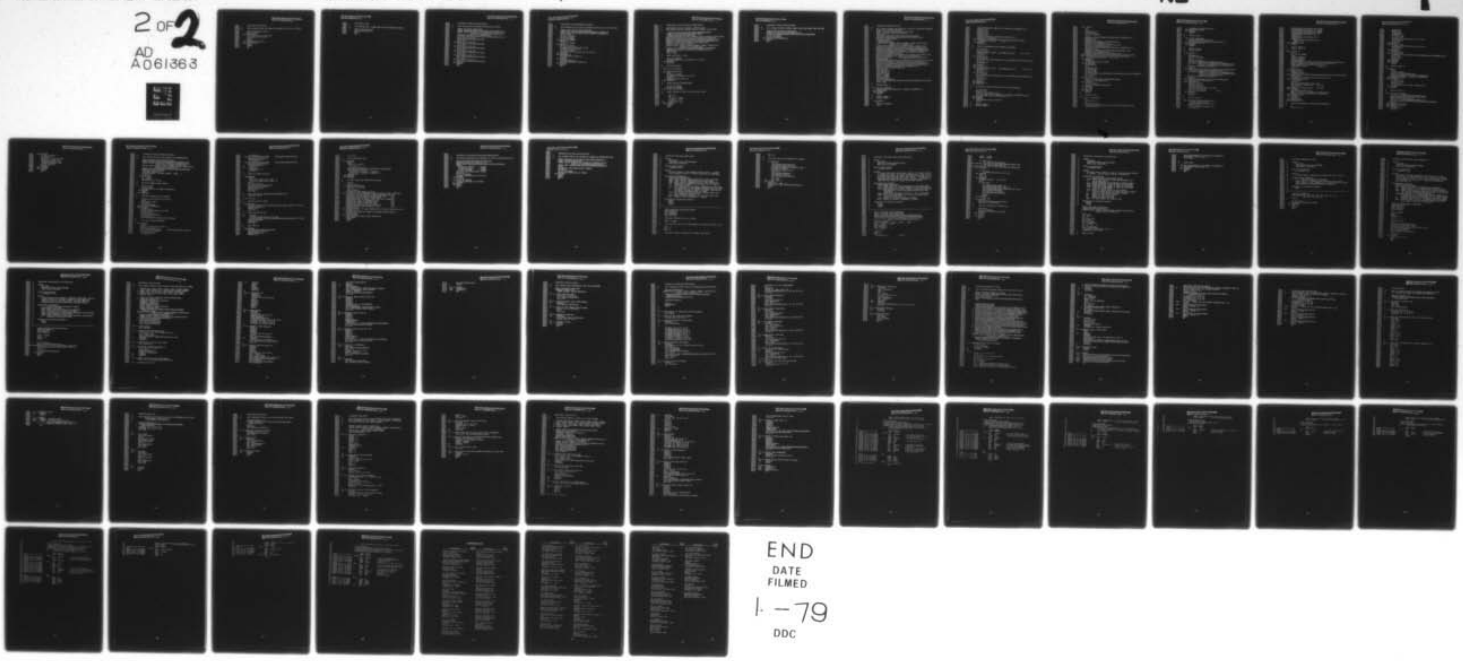
```
00001          SUBROUTINE SAVED(ITABLE)
00002     C
00003     C      THIS ROUTINE SAVES INPUT TABLES ON PERM FILE  LOGICAL UNIT 21
00004     C
00005          DOUBLE PRECISION INBUF,NAME
00006          DOUBLE PRECISION ITABLE
00007          DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00008          COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00009         +               IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00010          DIMENSION ITABLE(14,16,17)
00011     C
00012     C-------OPEN OUTPUT DESTINATION FILE.
00013            WRITE(5,1000)
00014            READ(5,1001) NAME
00015            OPEN(UNIT=21,FILE=NAME,ACCESS='SEQOUT',MODE='BINARY')
00016      100 WRITE(21) IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS,ITABLE
00017          CALL RELEAS(21)
00018          WRITE(5,1054)
00019       1054 FORMAT(1H0,'FILE HAS BEEN SAVED.')
00020          CALL DLAY(2)
00021          RETURN
00022     C
00023     C-------FORMATS
00024     1000     FORMAT($,' ENTER OUTPUT FILE NAME.(6 CHAR MAX)  ')
00025     1001     FORMAT(A10)
00026          END
```

```
00001           SUBROUTINE SETUP(ITABLE)
00002     C
00003     C     THIS ROUTINE LOADS INPUT TABLES FROM PERM FILE  LOGICAL UNIT 20
00004     C
00005           DOUBLE PRECISION INBUF,NAME
00006           DOUBLE PRECISION ITABLE,ITEMP,NULL
00007           DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00008           COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00009          +                IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00010           COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00011           COMMON /CURTAB/ FORMNO,FORM(24,80)
00012           INTEGER FORMNO,FORM,UFLD
00013           DIMENSION ITABLE(14,16,17),ITEMP(19,17)
00014           DATA UFLD/"7250040201007
00015     C
00016     C-------OPEN INPUT SOURCE FILE.
00017             WRITE(5,1000)
00018             READ(5,1001) NAME
00019             OPEN(UNIT=20,FILE=NAME,ACCESS='SEQIN',MODE='BINARY')
00020     C
00021     C
00022       100 READ (20) IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS,ITABLE
00023           CALL RELEAS(20)
00024     C
00025     C     DECODE VARIABLES FOR BATLE VARIABLES
00026     C
00027           DO 200 I=1,NIT
00028           DO 198 J=1,MAXFLD
00029           DO 198 K=1, MAXROW
00030       198 ITEMP(J,K)= ITABLE(I,J,K)
00031             FORMNO = I
00032             DO 199 IROW=1,24
00033             INX = IROW+24*(I-1)
00034             READ(23#INX,1002)(FORM(IROW,ICOL),ICOL=1,80)
00035     199     CONTINUE
00036             CALL FORMS(UFLD)
00037           CALL DCODE(I,ITEMP)
$FTNDIM LINE:00037 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00038       200 CONTINUE
00039           WRITE(5,1004)
00040      1004 FORMAT(1H0,'FILE HAS BEEN LOADED.')
00041           CALL DLAY(2)
00042           RETURN
00043     C
00044     C-------FORMATS
00045     1000     FORMAT($,' ENTER INPUT FILE NAME.(6 CHAR MAX)  ')
00046     1001     FORMAT(A10)
00047     1002     FORMAT(80A1)
00048           END
```

AD-A061 363 SRI INTERNATIONAL MENLO PARK CA NAVAL WARFARE RESEAR--ETC F/G 15/7
STRIKE OUTCOME CALCULATOR (SOC)--DESCRIPTION, AND OPERATING INS--ETC(U)
MAR 78 R S GARNERO, J C BOBICK, D AYERS N00014-75-C-0742

UNCLASSIFIED NWRC-TR-15 NL

2 OF 2
AD A061363



END
DATE FILMED
1-79
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```
00001          SUBROUTINE GETINT(IVAL)
00002     C
00003     C    THIS ROUTINE CHECKS AND CONVERTS RESPONSE TO RIGHT ADJ. INTEGER
00004     C
00005          DOUBLE PRECISION IV,V,IVT
00006          READ(5,4000)IV
00007     4000 FORMAT(A10)
00008          CALL NFIELD(IV,1,10,IVT,IERR)
00009          IF(IERR.EQ.0) GO TO 100
00010          IVAL=-1
00011          RETURN
00012      100 DECODE(10,4001,IVT) V
00013     4001 FORMAT(F10.0)
00014          IVAL=V
00015          RETURN
00016          END
```

```
00001          SUBROUTINE DUMRD
00002    C
00003    C     THIS ROUTINE DOES A DUMMY READ TO REGAIN PROGRAM CONTROL
00004    C
00005          DOUBLE PRECISION ITEMP
00006          CALL SCRNI(0,ITEMP)
00007          RETURN
00008          END
```

```
00001          SUBROUTINE SUBPRO(IT,ITEMP,ITABLE)
00002     C
00003     C    THIS ROUTINE DOES SUBSEQUENT PROCESSING FOR TABLES
00004     C
00005          DOUBLE PRECISION ITABLE,ITEMP
00006          DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00007          COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00008         +               IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00009          DIMENSION ITABLE(14,16,17),ITEMP(19,17)
00010          IF(IT.EQ.1.OR.IT.EQ.6.OR.IT.EQ.7.OR.IT.GE.10)GO TO 390
00011          IF(IT.GT.2) GO TO 310
00012          CALL ULIST(0,IUTYPE,IUSUB,ITEMP)
00013          GO TO 390
00014      310 IF(IT.GT.3) GO TO 320
00015          CALL ULIST(1,IUTYPE,IUSUB,ITEMP)
00016          GO TO 390
00017      320 IF(IT.GT.4) GO TO 330
00018          CALL ULIST(0,IETYPE,IESUB,ITEMP)
00019          GO TO 390
00020      330 IF(IT.GT.5) GO TO 340
00021          CALL ULIST(1,IETYPE,IESUB,ITEMP)
00022          GO TO 390
00023      340 IF(IT.GT.8) GO TO 350
00024          CALL CLIST(0,ICMPLX,ITEMP,ITABLE)
00025          GO TO 390
00026      350 IF(IT.GT.9) GO TO 390
00027          CALL CLIST(1,ICMPLX,ITEMP,ITABLE)
00028      390 CONTINUE
00029          RETURN
00030          END
```

```
00001           SUBROUTINE ULIST(IRED,NYPE,NUB,ITEMP)
00002     C
00003     C     THIS ROUTINE BUILDS LISTS OF RED/BLUE UNITS FOR UNIT AND FNG TBLES
00004     C
00005           DOUBLE PRECISION NULL,NYPE,NUB,ITEMP
00006           COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00007           DIMENSION NYPE(2,15),NUB(2,15,15),ITEMP(19,17),NNUB(15)
00008           IND= 1 +IRED
00009           DO 100 J=1,MAXUNT
00010           NYPE(IND,J)=NULL
00011           DO 100 K=1,MAXUNT
00012       100 NUB(IND,J,K)=NULL
00013           NNYPE=0
00014           DO 102 I=1,MAXUNT
00015       102 NNUB(I)=0
00016           DO 400 J=1,MAXUNT
00017           IF(ITEMP(1,J).EQ.NULL) GO TO 400
00018           IF(NNYPE.EQ.0) GO TO 200
00019           DO 150 JJ=1,NNYPE
00020           IF(ITEMP(1,J).EQ.NYPE(IND,JJ)) GO TO 250
00021       150 CONTINUE
00022       200 NNYPE=NNYPE+1
00023           NYPE(IND,NNYPE)=ITEMP(1,J)
00024           JJ=NNYPE
00025       250 CONTINUE
00026           NNUB(JJ)=NNUB(JJ)+1
00027           NUB(IND,JJ,NNUB(JJ))=ITEMP(2,J)
00028       400 CONTINUE
00029           RETURN
00030           END
```

```
00001          SUBROUTINE CLIST(IRED,ICMPLX,ITEMP,ITABLE)
00002     C
00003     C     THIS ROUTINE BUILDS  RED/BLUE  COMPLEX LISTS
00004     C     AND RESETS RELATIVE POSITION TABLE IF COMPLEX LIST CHANGES
00005     C
00006            INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00007          DOUBLE PRECISION NULL,ICMPLX,ITEMP,ITABLE
00008            DOUBLE PRECISION TTS,ORIG,TARG
00009          COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00010         +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00011         +RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),ORIG(2,20),
00012         +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00013         +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00014         +DAY(30), WX(30),IWX(30),NMISS(2)
00015          COMMON /SPECS/ ITABFR, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00016         1               ISLNK(15,17), IFORMT(2,19)
00017          COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00018          DIMENSION ICMPLX(2,8),ITEMP(19,17),ITABLE(14,16,17)
00019          INDT=8+IRED
00020          IND= 1 +IRED
00021     C
00022     C     CHECK FOR CHANGE TO LIST
00023     C
00024          DO 100 J=1,MAXCMP
00025          IF(ITABLE(INDT,1,J).NE.ITEMP(1,J)) GO TO 200
00026      100 CONTINUE
00027          GO TO 300
00028     C
00029     C     LIST HAS CHANGED
00030     C
00031      200 DO 250 J=1,MAXCMP
00032
00033      250 ICMPLX(IND,J)=NULL
00034          NC=0
00035          DO 260 J=1,MAXCMP
00036          IF(ITEMP(1,J).EQ.NULL) GO TO 260
00037          NC=NC+1
00038          ICMPLX(IND,NC)=ITEMP(1,J)
00039      260 CONTINUE
00040     C
00041     C     BLANK RELATIVE POSITION TABLE
00042     C
00043          DO 270 J=1,MAXCMP
00044          DO 270 K=1,MAXCMP
00045      270 ITABLE(13,J,K)=NULL
00046     C
00047     C     RESET INDEXING IN TABLE 13(RFL POS NOW LONG)
00048     C
00049            NPB = 8
00050            NPR = 8
00051            DO 275 J = 1,NPR
00052            DO 275 K = 1,NPB
00053            IRANGE(K,J) = 1
00054      275   RANGE(K,J) = NULL
00055      300 CONTINUE
00056          RETURN
               END
```

```
00001           SUBROUTINE TRSFM(IT,ITABLE,ITEMP)
00002     C
00003     C     THIS ROUTINE REPLACES CURRENT INPUT TABLE WITH ERROR FREE NEW TABL
00004     C
00005           DOUBLE PRECISION NULL,ITABLE,ITEMP
00006           DIMENSION ITABLE(14,16,17),ITEMP(19,17)
00007           COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,MIT,MAXFLD,MAXROW,NULL
00008           DO 100 J=1,MAXFLD
00009           DO 100 K=1,MAXROW
00010       100 ITABLE(IT,J,K)=ITEMP(J,K)
00011           RETURN
00012           END
```

```
00001          SUBROUTINE DCODE(ITABL,JEMP)
00002    C
00003    C     THIS ROUTINE DECODES AND PROCESSES A TABLE OF DATA INTO VARIABLES
00004    C     NEEDED FOR COMPUTING OUTCOMES
00005          DOUBLE PRECISION DCOMPS,DPLEX,ORIG,TARG,TTS
00006          DOUBLE PRECISION JEMP(19,17),NULL10
00007          REAL LRDEF
00008          INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY
00009          DIMENSION ESUNIT(2,20,2),ETRAT(2,20,4),EDEFAT(2,20,2),
00010         +EGKILL(2,20,10),NESUNT(2)
00011          DIMENSION IN(14)
00012            COMMON/ENDC/JENDC
00013          COMMON /SPECS/ ITABER, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00014         1               IBLNK(15,17), IFORMT(2,19)
00015          COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00016         +STRAT(2,20,4),ADEFAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00017         +DCOMPS(2,10),MAXR(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00018         +DRMAX(2,20),SPEED(2,20),IRRTIM(2,5), SR30MX(2,5),IMAXR(2,20),
00019         +ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00020          COMMON/BLOCKC/COMPLX(2,10,10),
00021         +DPLEX(2,10),DTSLI(2,10),SURFAC(2,10), DEFAC(2,10),ICYCLE(2,10),
00022         +IREPL(2,10),REPOPS(2,10,2),OPS(2,11),REPAIR(2,11),
00023         +NPLEX(2),NTIME(2),        NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,
00024         +OPSLCH,OPSLND
00025          COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),S2(2,20,2),
00026         +MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),TTS(2,20),
00027         +RANGE(10,10),TRANGE(10,10),DMISS(2,20),APRI(2,20),ORIG(2,20),
00028         +TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),TARGET(2,20),
00029         +IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00030         +DAY(30), WX(30),IWX(30),NMISS(2)
00031          DATA IN/14*0/
00032          DATA NCOMPS/6,8/
00033          DATA NULL/1H /
00034          DATA NULL10/10H          /
00035          NLINES = ITABNR
00036          NFLDS = ITABNF
00037          NCHARS=NFLDS*10
00038          IN(ITABL)=IN(ITABL)+1
00039          GO TO (100,200,200,400,400,600,700,800,800,1000,1100,1100,1300,
00040         +1400) ITABL
00041    C
00042    C     PROCESS TABLE 1
00043    C
00044      100 DO 150 J=1,NLINES
00045          DECODE(NCHARS,9010,JEMP(1,J)) DCOMPS(1,J),DCOMPS(2,J)
00046     9010 FORMAT(2A10)
00047      150 CONTINUE
00048          RETURN
00049    C
00050    C     PROCESS TABLE 2
00051    C     PROCESS TABLE 3
00052    C
00053      200 L=ITABL-1
00054          I=0
00055          DO 205 J=1,NLINES
00056          I=I+1
```

```
00057          DECODE(NCHARS,9020,JEMP(1,J)) DSUNIT(L,I,1),DSUNIT(L,I,2),
00058         +COMPS(L,I,1),
00059         +COMPS(L,I,2),
00060         +COMPS(L,I,3),
00061         +COMPS(L,I,4),
00062         +COMPS(L,I,5),
00063         + MAXR(L,I),LRDEF(L,I),WSTWX(L,I),BWDEF(L,I),
00064         +DRMAX(L,I), SPEED(L,I)
00065      9020 FORMAT(A5,5X,A3,7X,5(F3.0,7X),4(A4,6X),F5.0,5X,F6.0,4X)
00066          IF(DSUNIT(L,I,1).EQ.5H      )I=I-1
00067        205 CONTINUE
00068          NSUNIT(L)=I
00069    C
00070    C     REPLACE ALPHANUMERIC WITH NUMERIC DESCRIPTORS
00071    C
00072          NS=NSUNIT(L)
00073          DO 265 J=1,NS
00074          IF(MAXR(L,J).NE.5HLONG  .AND.MAXR(L,J).NE.5H       ) GO TO 210
00075          IMAXR(L,J)=1
00076          GO TO 230
00077        210 IMAXR(L,J)=2
00078          DO 220 K=1,NS
00079          IF(DSUNIT(L,J,1).NE.DSUNIT(L,K,1).OR.DSUNIT(L,K,2).NE.LRDEF(L,J))
00080         +GO TO 220
00081          ILRDEF(L,J)=K
00082          GO TO 240
00083        220 CONTINUE
00084        230 ILRDEF(L,J)=0
00085        240 IF(WSTWX(L,J).NE.5HBAD   .AND.WSTWX(L,J).NE.5H       ) GO TO 250
00086          IWSTWX(L,J)=1
00087          GO TO 260
00088        250 IWSTWX(L,J)=2
00089          DO 255 K=1,NS
00090          IF(DSUNIT(L,J,1).NE.DSUNIT(L,K,1).OR.DSUNIT(L,K,2).NE.BWDEF(L,J))
00091         +GO TO 255
00092          IBWDEF(L,J)=K
00093          GO TO 265
00094        255 CONTINUE
00095        260 IBWDEF(L,J)=0
00096        265 CONTINUE
00097    C
00098    C     ALL-WEATHER ATTACK AIRCRAFT ARE USED FOR SUPPRESSION
00099    C
00100          DO 280 J=1,NS
00101          DO 270 I=1,5
00102          SCOMPS(L,J,I)=COMPS(L,J,I)
00103          IF(I.EQ.2.AND.L.EQ.1) SCOMPS(L,J,2)=COMPS(L,J,2)+COMPS(L,J,5)
00104          IF(I.EQ.5.AND.L.EQ.1) SCOMPS(L,J,5)=0.0
00105        270 CONTINUE
00106        280 CONTINUE
00107          IF(IN(ITABL+2).GT.0) GO TO 415
00108          RETURN
00109    C
00110    C     PROCESS TABLE 4
00111    C     PROCESS TABLE 5
00112    C
```

```
00113      400 L=ITABL-3
00114          I=0
00115          LL=2
00116          IF(L.EQ.2) LL=1
00117          NT=NCOMPS(LL)
00118          DO 410 J=1,NLINES
00119          I=I+1
00120          IF(L.EQ.1) DECODE(NCHARS,9040,JEMP(1,J)) ESUNIT(L,I,1),
00121         +ESUNIT(L,I,2),
00122         +ETRAT(L,I,1),
00123         +ETRAT(L,I,2),ETRAT(L,I,3),ETRAT(L,I,4),
00124         +EDEFAT(L,I,1),EDEFAT(L,I,2),
00125         +EGKILL(L,I,4),EGKILL(L,I,5),EGKILL(L,I,6)
00126         +,EGKILL(L,I,7),EGKILL(L,I,8)
00127          IF(L.EQ.2) DECODE(NCHARS,9050,JEMP(1,J)) ESUNIT(L,I,1),
00128         +ESUNIT(L,I,2),
00129         +ETRAT(L,I,1),ETRAT(L,I,2),ETRAT(L,I,3),ETRAT(L,I,4),
00130         +EDEFAT(L,I,1),EDEFAT(L,I,2),
00131         +EGKILL(L,I,4),EGKILL(L,I,5),EGKILL(L,I,6)
00132     9040 FORMAT(A5,5X,A3,7X,4(F4.0,6X),F7.0,3X,F8.0,2X,5(F4.0,6X))
00133     9050 FORMAT(A5,5X,A3,7X,4(F4.0,6X),2(F8.0,2X),3(F7.0,3X))
00134            IF(ESUNIT(L,I,1).EQ.5H      ) I = I-1
00135      410 CONTINUE
00136          NESUNT(L)=I
00137          IF(IN(ITABL-2).EQ.0) RETURN
00138      415 NS=NSUNIT(L)
00139          NES=NESUNT(L)
00140          LL=2
00141          IF(L.EQ.2) LL=1
00142          NT=NCOMPS(LL)
00143          DO 450 J=1,NS
00144          DO 445 K=1,NES
00145          IF(DSUNIT(L,J,1).EQ.ESUNIT(L,K,1).AND.DSUNIT(L,J,2).EQ.ESUNIT(L,K,
00146         +2)) GO TO 430
00147          GO TO 445
00148      430 DO 435 KK=1,4
00149          IF(KK.LE.2) ADEFAT(L,J,KK)=EDEFAT(L,K,KK)
00150          STRAT(L,J,KK)=ETRAT(L,K,KK)
00151      435 CONTINUE
00152          DO 440 KK=4,NT
00153          AGKILL(L,J,KK)=EGKILL(L,K,KK)
00154      440 CONTINUE
00155          GO TO 450
00156      445 CONTINUE
00157      450 CONTINUE
00158          RETURN
00159      C
00160      C     PROCESS TABLE 6
00161      C
00162        600 DO 650 J=1,NLINES
00163          L=1
00164          IF(J.GT.4) L=2
00165          K=J
00166          IF(L.EQ.2) K=J-4
00167          DECODE(NCHARS,9060,JEMP(1,J)) SRATE(L,1,K),SRATE(L,2,K),A
00168          IRRTIM(L,K)=A+.5
```

```
00169          SR30MX(L,K)=SRATE(L,1,K)*30.0
00170       9060 FORMAT(3(F6.0,4X))
00171        o50 CONTINUE
00172          RETURN
00173      C
00174      C       PROCESS TABLE 7
00175      C
00176        700 DO 750 J=1,NLINES
00177          DECODE(NCHARS,9070,JEMP(1,J))
00178         +OPS(1,J),OPS(2,J),REPAIR(1,J),REPAIR(2,J)
00179       9070 FORMAT(4(F7.0,3X))
00180        750 CONTINUE
00181          RETURN
00182      C
00183      C       PROCESS TABLE 8
00184      C       PROCESS TABLE 9
00185      C
00186        800 L=ITABL-7
00187          I=0
00188          NC=NCOMPS(L)
00189          DO 850 J=1,NLINES
00190          I=I+1
00191          DPLEX(L,I)=NULL10
00192          IF(L.EQ.1) DECODE(NCHARS,9080,JEMP(1,J))
00193         +DPLEX(L,I),COMPLX(L,I,1),COMPLX(L,I,2),COMPLX(L,I,3),
00194         +            COMPLX(L,I,4),COMPLX(L,I,5),COMPLX(L,I,6),
00195         +DTSLI(L,I),SURFAC(L,I),DEFAC(L,I
00196         +),A,B,C
00197       9080 FORMAT(A6,4X,5(F4.0,6X),F6.0,4X,3(F5.0,5X),3(F4.0,6X))
00198          IF(L.EQ.2) DECODE(NCHARS,9090,JEMP(1,J))
00199         + DPLEX(L,I),COMPLX(L,I,1),COMPLX(L,I,2),COMPLX(L,I,3)
00200         +           ,COMPLX(L,I,4),COMPLX(L,I,5),COMPLX(L,I,6),
00201         +            COMPLX(L,I,7),COMPLX(L,I,8),
00202         +DTSLI(L,I),SURFAC(L,I),DEFAC(L,I
00203         +),A,B,C
00204       9090 FORMAT(A6,4X,8(F3.0,7X),3(F5.0,5X),3(F4.0,6X))
00205          DECODE(10,9091,JEMP(16,J)) C
00206       9091 FORMAT(F10.0)
00207          ICYCLE(L,I)=A+.50
00208          IREPL(L,I)=B+.50
00209          REPOPS(L,I,2)=NULL
00210          IF(C.LT.0.0000) REPOPS(L,I,2)=1HD
00211          REPOPS(L,I,1)=ABS(C)
00212          IF( DPLEX(L,I).EQ.10H           ) I=I-1
00213        850 CONTINUE
00214          NPLEX(L)=I
00215          RETURN
00216      C
00217      C       PROCESS TABLE 10
00218      C
00219       1000 DECODE(NCHARS,9100,JEMP(1,1)) A
00220              NDAYS= MIN1(A+.5,10.)
00221          DECODE(NCHARS,9100,JEMP(1,2)) A
00222          MTIME(1)=A+.5
00223          DECODE(NCHARS,9100,JEMP(1,3)) A
00224          MTIME(2)=A+.5
```

```
00225          DECODE(NCHARS,9100,JEMP(1,4)) OPSLND
00226          DECODE(NCHARS,9100,JEMP(1,5)) OPSLCH
00227          DECODE(NCHARS,9100,JEMP(1,6)) WXSURV
00228          DECODE(NCHARS,9100,JEMP(1,7)) DFLAY
00229          DECODE(NCHARS,9100,JEMP(1,8)) A
00230          JLRDEF=A+.1
00231          DECODE(NCHARS,9100,JEMP(1,9)) A
00232          JWXDEF=A+.1
00233            DECODE(NCHARS,9100,JEMP(1,10)) A
00234            JENDC = A+.1
00235   9100   FORMAT(F4.0,6X)
00236          RETURN
00237     C
00238     C    PROCESS TABLE 11
00239     C    PROCESS TABLE 12
00240     C
00241    1100  L=ITABL-10
00242          I=0
00243          DO 1150 J=1,NLINES
00244          I=I+1
00245          ORIG(L,I)=NULL10
00246          TARG(L,I)=NULL10
00247          TTS(L,I)=NULL10
00248          DECODE(NCHARS,9110,JEMP(1,J)) DMISS(L,I),IPRI(L,I),ORIG(L,I),
00249         +TARG(L,I),S1(L,I,1),S2(L,I,1),S1(L,I,2),S2(L,I,2),
00250         +TTS(L,I),UNIT(L,I,1),UNIT(L,I,2),A,B,C
00251          IF(DMISS(L,I).NE.5H           ) GO TO 1120
00252          I=I-1
00253          GO TO 1150
00254    1120  UMAX(L,I)=A+.5
00255          UMIN(L,I)=B+.5
00256          UREADY(L,I)=C+.5
00257    9110  FORMAT(A5,5X,I1,9X,2(A6,4X),A3,A5,2X,A3,A5,2X,A8, 2X,A5,5X,A3,7X,
00258         +3(F3.0,7X))
00259          DECODE(30,9111,JEMP(13,J))S1(L,I,1),S1(L,I,2)
00260    9111  FORMAT(A3,17X,A3,7X)
00261          DO 1145 N=1,2
00262          JJ=N*2+12
00263          IF(S1(L,I,N).EQ.3HEND) GO TO 1140
00264          DECODE(10,9112,JEMP(JJ,J))   S2(L,I,N)
00265          GO TO 1145
00266    1140  DECODE(10,9113,JEMP(JJ,J))   S2(L,I,N)
00267    1145  CONTINUE
00268          DECODE(10,9114,TTS(L,I))
00269         +MTS(L,I,1),MTS(L,I,2),MTS(L,I,3),MTS(L,I,4),
00270         +MTS(L,I,5),MTS(L,I,6),MTS(L,I,7),MTS(L,I,8)
00271    9114  FORMAT(8I1,2X)
00272    1150  CONTINUE
00273          NMISS(L)=I
00274    9112  FORMAT(5X,A5)
00275    9113  FORMAT(A5,5X)
00276     C
00277     C    REPLACE ALPHANUMERIC WITH NUMERIC DESCRIPTORS
00278     C
00279          LL=2
00280          IF(L.EQ.2) LL=1
```

```
00281          NM=NMISS(L)
00282          NO=NPLEX(L)
00283          NT=NPLEX(LL)
00284          NU=NSUNIT(L)
00285          DO 1235 M=1,NM
00286          DO 1205 K=1,NO
00287          IF(ORIG(L,M).NE.DPLEX(L,K)) GO TO 1205
00288          ORIGIN(L,M)=K
00289          GO TO 1210
00290     1205 CONTINUE
00291     1210 DO 1215 K=1,NT
00292          IF(TARG(L,M).NE.DPLEX(LL,K)) GO TO 1215
00293          TARGET(L,M)=K
00294          GO TO 1220
00295     1215 CONTINUE
00296          TARGET(L,M)=0
00297     1220 DO 1230 J=1,NU
00298          IF(UNIT(L,M,1).NE.DSUNIT(L,J,1).OR.UNIT(L,M,2).NE.DSUNIT(L,J,2))
00299         +GO TO 1230
00300          IUNIT(L,M)=J
00301          GO TO 1235
00302     1230 CONTINUE
00303     1235 CONTINUE
00304          RETURN
00305     C
00306     C      PROCESS TABLE 13
00307     C
00308     1300 NPR=8
00309          NPR=8
00310          DO 1350 J=1,NPR
00311          DECODE(NCHARS,9130,JEMP(1,J))
00312         +RANGE(1,J),RANGE(2,J),RANGE(3,J),RANGE(4,J),
00313         +RANGE(5,J),RANGE(6,J),RANGE(7,J),RANGE(8,J)
00314     9130 FORMAT(8(A5,5X))
00315     1350 CONTINUE
00316          DO 1360 J=1,NPR
00317          DO 1360 K=1,NPR
00318          IRANGE(J,K)=1
00319          IF( RANGE(J,K).EQ.5HSHORT) IRANGE(J,K)=2
00320     1360 CONTINUE
00321          RETURN
00322     C
00323     C      PROCESS TABLE 14
00324     C
00325     1400 DO 1450 J=1,NLINES
00326          IF(J.EQ.1) DECODE(NCHARS,9140,JEMP(1,J))
00327         +DAY(1),DAY(2),DAY(3),DAY(4),DAY(5),DAY(6),
00328         +DAY(7),DAY(8),DAY(9),DAY(10)
00329          IF(J.EQ.2) DECODE(NCHARS,9141,JEMP(1,J))
00330         +WX(1),WX(2),WX(3),WX(4),WX(5),WX(6),WX(7),WX(8),WX(9),
00331         +WX(10)
00332     9140 FORMAT(10(F5.0,5X))
00333     9141 FORMAT(10(A5,5X))
00334     1450 CONTINUE
00335          DO 1460 K=1,30
00336          IWX(K)=2
```

```
00337     1460 CONTINUE
00338          DO 1480 K=1,NFLDS
00339          ID=DAY(K)+.5
00340          IF(ID.GT.   30) GO TO 1480
00341          IF(ID.EQ.0) GO TO 1480
00342          IF(WX(K).EQ.4HBAD ) IW=1
00343          IF(WX(K).EQ.4HGOOD) IW=2
00344          DO 1470 KK=ID,30
00345          IWX(KK)=IW
00346     1470 CONTINUE
00347     1480 CONTINUE
00348          RETURN
00349          END
```

```
00001          SUBROUTINE ERROR(IT,ITEMP,IERR,INTER)
00002    C
00003    C     THIS ROUTINE SCREENS DATA ENTRIES FOR INCONSISTANCIES
00004    C
00005          DOUBLE PRECISION NULL,ITEMP,IVAL,IWDS
00006          DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00007          COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00008         +               IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00009          COMMON /SPECS/ ITABFR, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00010         1               IBLNK(15,17), IFORMT(2,19)
00011          COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00012          DIMENSION IBADS(9),IWDS(4)
00013          DIMENSION ITEMP(19,17)
00014          DATA IWDS/6HLONG  ,6HSHORT ,6HGOOD  ,6HBAD   /
00015          DO 100 I=1,9
00016      100 IBADS(I)=0
00017          NR = ITABNR
00018          NF = ITABNF
00019          IF(IERR.EQ.0) GO TO 200
00020    C
00021    C     COUNT NON NUMERIC ENTRY ERRORS
00022    C
00023          DO 110 I=1,NF
00024          DO 110 J=1,NR
00025          IF(IBLNK(I,J).EQ.1) IBADS(9)=IBADS(9)+1
00026      110 CONTINUE
00027          IERR=0
00028      200 CONTINUE
00029    C
00030    C     CONSTRUCT MISSION LISTS IF NEEDED
00031    C
00032          IF(IT.LE.10.OR.IT.GE.13) GO TO 400
00033          IRED=0
00034          IF(IT.EQ.12) IRED=1
00035          IND=IRED+1
00036          DO 350 I=1,MAXMIS
00037      350 MISS(IND,I)=ITEMP(1,I)
00038      400 CONTINUE
00039          DO 990 J=1,NR
00040          IF(ITEMP(1,J).EQ.NULL) GO TO 990
00041          DO 900 I=1,NF
00042          ISEP=IFLDS(IT,I)-1
00043          IF(ISEP.LE.0) GO TO 900
00044          IVAL=ITEMP(I,J)
00045          GO TO (810,820,830,840,850,860,870),ISEP
00046    C
00047    C     CHECK FORCE UNIT DEFINITION
00048    C
00049      810 CONTINUE
00050          IRED=0
00051          IF(IT.EQ.3.OR.IT.EQ.12) IRED=1
00052          IF(IT.GT.3) GO TO 815
00053          CALL CKTS(ITEMP(1,J),IVAL      ,IRED,IUTYPE,IUSUB,IERR,IT)
00054          IF(IERR.EQ.0) GO TO 900
00055          IBADS(1)=IBADS(1)+1
00056            IBLNK(I,J) = 1
```

```
00057           GO TO 900
00058     815 CALL CKTS(ITEMP(8,J),IVAL       ,IRED,IUTYPE,IUSUB,IERR,IT)
00059         IF(IERR.EQ.0) GO TO 816
00060         IBADS(1)=IBADS(1)+1
00061           GO TO 818
00062     816 CALL CKTS(ITEMP(8,J),IVAL       ,IRED,IETYPE,IESUB,IERR,IT)
00063         IF(IERR.EQ.0) GO TO 900
00064         IBADS(2)=IBADS(2)+1
00065   818     CONTINUE
00066         IBLNK(I,J)=1
00067           IBLNK(I-1,J) = 1
00068         GO TO 900
00069   C
00070   C     CHECK FOR COMPLEX ON LIST
00071   C
00072     820 CONTINUE
00073         IRED=0
00074           IF(IT.EQ.11.AND.I.EQ.4) IRED = 1
00075           IF(IT.EQ.12.AND.I.EQ.3) IRED = 1
00075         IBOK=0
00077         IF(I.EQ.4) IBOK=1
00078         CALL CKC(IVAL,IRED,IERR,IBOK)
00079         IF(IERR.EQ.0) GO TO 900
00080         IBADS(3)=IBADS(3)+1
00081         IBLNK(I,J)=1
00082         GO TO 900
00083   C
00084   C     CHECK FOR MISSION PRESENCE ON APPROPRIATE LIST
00085   C     DONE WHEN ISEP=7
00086   C
00087     830 GO TO 900
00088   C
00089   C     CHECK FOR LONG OR SHORT
00090   C
00091     840 CONTINUE
00092         IF(IVAL.EQ.IWDS(1).OR.IVAL.EQ.IWDS(2).OR.IVAL.EQ.NULL) GO TO 900
00093         IBADS(5)=IBADS(5)+1
00094         IBLNK(I,J)=1
00095         GO TO 900
00096   C
00097   C     CHECK FOR GOOD OR BAD
00098   C
00099   850     CONTINUE
00100           IF(IT.EQ.14.AND.J.EQ.1) GO TO 990
00101           IF(IVAL.EQ.IWDS(3).OR.IVAL.EQ.IWDS(4).OR.IVAL.EQ.NULL) GO TO 900
00102         IBADS(6)=IBADS(6)+1
00103         IBLNK(I,J)=1
00104         GO TO 900
00105   C
00106   C     CODE REPL OPS
00107   C
00108     860 CONTINUE
00109         CALL ERR1(IVAL,ITEMP(16,J),IERR)
00110         IF(IERR.EQ.0) GO TO 900
00111         IBADS(7)=IBADS(7)+1
00112         IBLNK(I,J)=1
```

```
00113          GO TO 900
00114    C
00115    C     CHECK START/STOP FIELD
00116    C
00117      870 CONTINUE
00118          IRED=0
00119          IF(IT.EQ.12) IRED=1
00120            KK = 13
00121            IF(I.EQ.6) KK = 15
00122          CALL ERR2(IVAL,ITEMP(KK,J),ITEMP(KK+1,J),IERR,IRED)
00123          IF(IERR.EQ.0) GO TO 900
00124            IF(IERR.EQ.1) IBADS(8) = IBADS(8)+1
00125            IF(IERR.EQ.2) IBADS(4) = IBADS(4) + 1
00126          IBLNK(I,J)=1
00127      900 CONTINUE
00128      990 CONTINUE
00129    C
00130    C     IF ERRORS HAVE BEEN FOUND WRITE MESSAGES
00131    C
00132          IBADT=0
00133          DO 995 I=1,9
00134      995 IBADT=IBADT+IBADS(I)
00135          IF(IBADT.EQ.0) RETURN
00136          IERR=1
00137          CALL NWSCRN(0)
00138          WRITE(5,4000)IT,(IBADS(I),I=1,9)
00139     4000 FORMAT(33H INPUT ERRORS WERE FOUND IN TABLE,I3,14X,  6HNUMBER/
00140         148HOFORCE UNIT NOT DEFINED IN UNIT DEFINITION TABLE,I7/
00141         248HOFORCE UNIT NOT DEFINED IN ENGAGEMENT TABLE     ,I7/
00142         348HOCOMPLEX NOT DEFINED IN COMPLEX TABLE           ,I7/
00143         448HOMISSION NAME IN START OR STOP FIELD NOT DEFINED,I7/
00144         548HOILLEGAL ENTRY IN LONG/SHORT FIELD              ,I7/
00145         648HOILLEGAL ENTRY IN GOOD/BAD FIELD                ,I7/
00146         748HOILLEGAL ENTRY IN REPL OPS FIELD                ,I7/
00147         848HOILLEGAL ENTRY IN START OR STOP FIELD           ,I7/
00148         948HONON NUMERIC ENTRY IN NUMERIC FIELD             ,I7/)
00149          WRITE(5,1022)
00150     1022 FORMAT(64H WHEN THE TABLE REAPPEARS THE FIELDS IN ERROR WILL BE IN
00151         1DICATED./1H ,
00152         253HYOU MAY CORRECT THE ERRORS OR RESTORE ORIGINAL TABLE.)
00153          WRITE(5,2022)
00154     2022 FORMAT($,1H0,
00155         136HTO RETURN TO TABLE STRIKE SPACE BAR.)
00156          CALL DUMRD
00157          RETURN
00158          END
```

```
00001
00002           SUBROUTINE CKTS(NYPE,NUB,IRED,INYPE,INUB,IERR,IT)
00003     C
00004     C     THIS ROUTINE VALIDATES THE PRESENCE OF A UNIT ON APPROPPIATE LIST
00005     C
00006           DOUBLE PRECISION NYPE,NUB,INYPE,INUB,NULL
00007           DIMENSION INYPE(2,15),INUB(2,15,15)
00008           COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00009           IERR=0
00010             IF(NYPE.EQ.10HVFCAP      ) RETURN
00011             IF(NYPE.EQ.10HDLI        ) RETURN
00012             IF(NYPE.EQ.10HSLI        ) RETURN
00013           IF(IT.LE.3.AND.NUB.EQ.NULL) RETURN
00014           IND=IRED+1
00015           DO 100 J=1,MAXUNT
00016           IF(NYPE.EQ.INYPE(IND,J)) GO TO 200
00017       100 CONTINUE
00018           GO TO 900
00019       200 DO 300 K=1,MAXUNT
00020           IF(NUB.EQ.INUB(IND,J,K)) RETURN
00021       300 CONTINUE
00022       900 IERR=1
00023           RETURN
00024           END
```

```
00001
00002          SUBROUTINE CKC(ICOMP,IRED,IEPR,IBOK)
00003    C
00004    C     THIS ROUTINE CHECKS FOR PRESENCE OF COMPLEX ON APPROPRIATE LIST
00005    C
00006          DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00007          DOUBLE PRECISION NULL,ICOMP
00008          COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00009         +               IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00010          COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00011          IERR=0
00012          IF(IBOK.EQ.1.AND.ICOMP.EQ.NULL) RETURN
00013          IND=IRED+1
00014          DO 100 J=1,MAXCMP
00015          IF(ICOMP.EQ.ICMPLX(IND,J)) RETURN
00016      100 CONTINUE
00017          IERR=1
00018          RETURN
00019          END
```

```
00001
00002          SUBROUTINE ERR1(IWORD,JWORD,IERR)
00003     C
00004     C    AUTHOR
00005     C        BOB RINGO
00006     C        STANFORD RESEARCH INSTITUTE/NWRC
00007     C        MENLO PARK CALIFORNIA
00008     C
00009     C    DATE OF LAST REVISION
00010     C        1 DECEMBER 1976
00011     C
00012     C    PURPOSE
00013     C        TO RIGHT JUSTIFY A LEFT JUSTIFIED NUMERIC FIELD.  IF INPUT
00014     C        FIELD CONTAINS A *D*, A (-) SIGN IS PREFIXED TO OUTPUTWORD.
00015     C
00016     C    DESCRIPTION OF VARIABLES
00017     C        IBLANK-BLANK FILLED WORD
00018     C        IBLNK -RIGHT ADJUSTED BLANK CHARACTER IN ZERO FILLED WORD
00019     C        ICHAR -RIGHT ADJUSTED CHARACTER IN ZERO FILLED WORD
00020     C        IDEE  -RIGHT ADJUSTED CHARACTER *D* IN A ZERO FILLED WORD
00021     C        IERR  -ERROR TAG--(0) SUBROUTINE PROCESSED OK,(1) ERROR IN
00022     C               INPUT WORD *IWORD*
00023     C        INUM  -TAG INDICATING (0) NO NUMERIC CHARACTER HAS BEEN FOUND
00024     C               IN *IWORD* OR (1) FIRST NUMERIC CHARACTER HAS BEEN FOUN
00025     C        IS    -CHARACTER POSITION IN *IWORD* INDICATING CHARACTER TO
00026     C               BE EXAMINED AND TRANSFERRED TO *JWORD*
00027     C        IWORD -LEFT ADJUSTED NUMERIC CHARACTER FIELD(4 BYTES) THAT
00028     C               MAY CONTAIN THE CHARACTER *D*
00029     C        MINUS -RIGHT ADJUSTED CHARACTER (-) IN A ZERO FILLED WORD
00030     C        NDS   -NUMBER OF *D*S ENCOUNTERED IN *IWORD*
00031     C
00032     C    FUNCTIONS OR SUBROUTINES REQUIRED
00033     C        GETCHA
00034     C        PUTCHA
00035     C        NUMCHK
00036     C
00037     C-------------------------------------------------------------------------
00038     C
00039          DOUBLE PRECISION IWORD,JWORD,IBLANK
00040          DATA IBLNK/1H /
00041          DATA IBLANK/6H      /
00042          DATA MINUS/1H-/
00043          DATA IDEE/1HD/
00044     C
00045     C    INITIALIZE OUTPUT WORD TO ALL BLANKS
00046     C
00047          JWORD = IBLANK
00048     C
00049     C    SET ERROR TAG, NO. OF *D*S ENCOUNTERED, AND FIRST DIGIT TAG TO ZER
00050     C
00051          IERR = 0
00052          NDS = 0
00053          INUM = 0
00054     C
00055     C    INITIALIZE STARTING CHARACTERS IN *IWORD* AND *JWORD*
00056     C
```

```
00057          IS = 5
00058          JS = 10
00059    C
00060    C     LOOP OVER FIRST FOUR CHARACTERS OF *IWORD*
00061    C
00062          DO 100 I=1,4
00063              IS=IS-1
00064              CALL GETCHA(ICHAR,IWORD,IS)
00065              IF(ICHAR.EQ.IBLNK) GO TO 100
00066              IF(ICHAR.EQ.IDEE.AND.INUM.EQ.1) IERR = 1
00067            IF(IERR.EQ.1) RETURN
00068              IF(ICHAR.EQ.IDEE) GO TO 50
00069              INUM = 1
00070              CALL NUMCHK(ICHAR,IERR)
00071              IF(IERR.EQ.1) RETURN
00072              CALL PUTCHA(ICHAR,JWORD,JS)
00073              JS = JS - 1
00074              GO TO 100
00075       50     NDS = NDS + 1
00076      100 CONTINUE
00077          IF(NDS.GT.1) IERR = 1
00078          IF(NDS.EQ.1) CALL PUTCHA(MINUS,JWORD,JS)
00079          RETURN
00080          END
```

```
00001
00002          SUBROUTINE ERR2(IWORD,JWORD,KWORD,IERR,IRED)
00003    C
00004    C     AUTHOR
00005    C         BOB RINGO
00006    C         STANFORD RESEARCH INSTITUTE/NWRC
00007    C         MENLO PARK, CALIFORNIA
00008    C
00009    C     DATE OF LAST REVISION
00010    C         1 DECEMBER 1976
00011    C
00012    C     PURPOSE
00013    C         TO DIVIDE INPUT WORD *IWORD* INTO 2 WORDS.  THE FIRST 3 CHARAC
00014    C         OF *IWORD* ARE PLACED IN *JWORD* BLANK FILLED.  IF THE FIRST 3
00015    C         CHARACTERS OF *IWORD* ARE *END*, THE NEXT 5 CHARACTERS OF *IWO
00016    C         ARE LEFT JUSTIFIED BLANK FILLED INTO *KWORD*  . IF THE FIRST 3
00017    C         CHARACTERS OF *IWORD* ARE NOT *END*, THE NEXT 5 CHARACTERS OF
00018    C         IWORD ARE RIGHT JUSTIFIED BLANK FILLED INTO *KWORD*.
00019    C
00020    C     DESCRIPTION OF VARIABLES
00021    C         IBLANK-BLANK FILLED WORD
00022    C         IBLNK -BLANK CHARACTER, RIGHT JUSTIFIED IN ZERO FILLED WORD
00023    C         IERR  -ERROR FLAG--(0) ROUTINE PROCESSED OK,(1) PROCESSING ERR
00024    C         IRBLNK-TAG INDICATING--(0) RIGHT BLANKS IN CHARACTER STRING TO
00025    C                TRANSFERRED, (1) FIRST NON-BLANK CHARACTER HAS BEEN
00026    C                ENCOUNTERED
00027    C         IWORD -INPUT WORD CONTAINING 2 FIELDS OF 3 AND 5 CHARACTERS
00028    C         JWORD -OUTPUT WORD CONTAINING 1ST 3 CHARS OF *IWORD*, LEFT
00029    C                JUSTIFIED BLANK FILLED
00030    C         KODES -VECTOR OF LEGITIMATE VALUES OF *JWORD*
00031    C         NPRD  -NUMBER OF PERIODS ENCOUNTERED IN *IWORD*
00032    C
00033    C     SUBROUTINES OR FUNCTIONS REQUIRED
00034    C         AFIELD
00035    C         GETCHA
00036    C         PUTCHA
00037    C
00038    C-------------------------------------------------------------------------
00039    C
00040          DOUBLE PRECISION KODES,IBLANK,NULL
00041          DOUBLE PRECISION IWORD,JWORD,KWORD
00042          DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS
00043          COMMON /MAX/ MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00044          COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00045         +               IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00046          DIMENSION KODES(7)
00047          DATA KODES/6HDAY   ,6HCOA   ,6HDDA   ,6HDLS   ,
00048         16HDOS   ,6HDDS   ,6HEND   /
00049          DATA IBLNK/1H /
00050          DATA IPRD/1H./
00051          DATA IBLANK/6H      /
00052    C
00053          IRBLNK = 0
00054          NPRD = 0
00055          IERR = 0
00056            IF(IWORD.EQ.10H           ) RETURN
```

```
00057           JWORD = IBLANK
00058           KWORD = IBLANK
00059     C
00060           DO 100 I=1,3
00061               CALL GETCHA(ICHAR,IWORD,I)
%FTNDIM LINE:00061 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00062               CALL PUTCHA(ICHAR,JWORD,I)
%FTNDIM LINE:00062 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00063       100 CONTINUE
00064     C
00065           DO 200 I=1,7
00066               IF(JWORD.EQ.KODES(I)) GO TO 300
00067       200 CONTINUE
00068           IERR = 1
00069           GO TO 600
00070       300 CONTINUE
00071           IF(JWORD.EQ.6HEND    ) GO TO 500
00072           KS=10
00073           DO 400 I=4,8
00074               IS = 12 - I
00075               CALL GETCHA(ICHAR,IWORD,IS)
00076               IF(ICHAR.EQ.IPRD) NPRD = NPRD + 1
00077               IF(ICHAR.EQ.IBLNK.AND.IRBLNK.EQ.0) GO TO 400
00078               CALL NUMCHK(ICHAR,IERR)
00079               IF(IERR.EQ.1)  GO TO 600
00080               CALL PUTCHA(ICHAR,KWORD,KS)
00081               KS=KS-1
00082               IRBLNK = 1
00083       400 CONTINUE
00084               GO TO 600
00085       500 CONTINUE
00086           CALL AFIELD(IWORD,4,8,KWORD,IERR)
00087           IF(IERR.EQ.1) GO TO 600
00088     C
00089     C     CHECK FOR PRESENCE ON MISSION LIST
00090     C
00091           IND=IRED+1
00092           DO 550 J=1,MAXMIS
00093           IF(KWORD.EQ.MISS(IND,J)) RETURN
00094       550 CONTINUE
00095           IERR=2
00096       600 CONTINUE
00097           RETURN
00098           END
```

```
00001
00002          SUBROUTINE GETLR(INBUF,ITN,ITEMP,IERR)
00003    C
00004    C     AUTHOR
00005    C         BOB RINGO
00006    C         STANFORD RESEARCH INSTITUTE/NWRC
00007    C         MENLO PARK, CALIFORNIA
00008    C
00009    C     DATE OF LAST REVISION
00010    C         24 NOVEMBER 1976
00011    C
00012    C     PURPOSE
00013    C         TO DECODE VECTOR *INBUF* BY LINE BY FIELD AND PLACE RESULTS
00014    C         IN *ITEMP*.  LIMITED ERROR CHECKING IS PERFORMED.
00015    C
00016    C     DESCRIPTION OF VARIABLES
00017    C         I      -INDEX TO LINE WITHIN VECTOR *INBUF*
00018    C         IBLNK -ARRAY INDICATING IF A FIELD HAS AN ERROR(1) OR
00019    C                 WAS DECODED OK (0)
00020    C         IE     -ENDING CHARACTER TO BE DECODED IN VECTOR *INBUF*
00021    C         IFLDS -ARRAY INDICATING LENGTH OF FIELD TO BE DECODED
00022    C         INBUF -CHARACTER STRING VECTOR OF TABLE TO BE DECODED
00023    C         ITABS -ARRAY INDICATING NUMBER OF LINES AND FIELDS PER
00024    C                 LINE FOR A GIVEN TABLE
00025    C         ITEMP -ARRAY OF FIELDS DECODED BY THIS ROUTINE
00026    C         IS     -STARTING CHARACTER TO BE DECODED IN VECTOR *INBUF*
00027    C         J      -INDEX TO FIELD WITHIN LINE TO BE DECODED
00028    C         LNF    -LENGTH OF FIELD TO BE DECODED
00029    C         NF     -NUMBER OF FIELDS PER LINE
00030    C         NL     -NUMBER OF LINES PER TABLE
00031    C         NORA   -(0) ALPHA FIELD, (1) NUMERIC FIELD
00032    C
00033    C     SUBROUTINES OR FUNCTIONS REQUIRED
00034    C         AFIELD
00035    C         NFIELD
00036    C
00037          DOUBLE PRECISION INBUF,ITEMP
00038          DIMENSION INBUF(1),ITEMP(19,17)
00039          COMMON /SPECS/ ITABFR, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00040         1               IBLNK(15,17), IFORMT(2,19)
00041    C
00042          IERR = 0
00043          NL = ITABNR
00044          IE = 0
00045          DO 1000 I=1,NL
00046          NF = ITABNF
00047          DO 1000 J=1,NF
00048          LNF = IFORMT(2,J)
00049          IS = IE + 1
00050          IE = IS + LNF - 1
00051          NORA = IFLDS(ITN,J)
00052            IF(ITN.EQ.14.AND.I.EQ.1) NORA = 1
00053          IF(NORA.NE.1) GO TO 500
00054    C
00055    C     NUMERIC FIELD
00056    C
```

```
00057          CALL NFIELD(INBUF,IS,IE,ITEMP(J,I),IBLNK(J,I))
00058          IF(IBLNK(J,I).EQ.1) IERR = 1
00059          GO TO 1000
00060
00061    C
00062    C     ALPHA FIELD
00063    C
00064      500 CALL AFIELD(INBUF,IS,IE,ITEMP(J,I),IBLNK(J,I))
00065          IF(IBLNK(J,I).EQ.1) IERR = 1
00066     1000 CONTINUE
00067          RETURN
00068          END
```

```
00001          SUBROUTINE NUMCHK(ICHAR,IERR)
00002     C
00003     C    AUTHOR
00004     C         BOB RINGO
00005     C         STANFORD RESEARCH INSTITUTE/NWRC
00006     C         MENLO PARK, CALIFORNIA
00007     C
00008     C    DATE OF LAST REVISION
00009     C         24 NOVEMBER 1976
00010     C
00011     C    PURPOSE
00012     C         TO CHECK NUMERIC CHARACTERS TO ENSURE THEY ARE 0-9 OR (.)
00013     C
00014     C    DESCRIPTION OF VARIABLES
00015     C         I      -INDEX OF CHARACTER IN *LEGNUM*
00016     C         ICHAR -CHAR TO BE CHECKED,RIGHT JUSTIFIED, ZERO FILLED
00017     C         IERR  -ERROR TAG--(0) *ICHAR* OK, (1) ILLEGAL CHAR IN *ICHAR*
00018     C         LEGNUM-VECTOR OF LEGITIMATE NUMERIC CHARACTERS
00019     C
00020     C    FUNCTIONS OR SUBROUTINES REQUIRED
00021     C         NONE
00022     C
00023     C-------------------------------------------------------------------------
00024     C
00025          DIMENSION LEGNUM(13)
00026          DATA LEGNUM /1H-, 1H0, 1H1, 1H2, 1H3, 1H4, 1H5, 1H6,
00027         +             1H7, 1H8, 1H9, 1H., 1H /
00028          IERR=0
00029     C
00030          DO 100 I=1,13
00031          IF(ICHAR.EQ.LEGNUM(I)) RETURN
00032      100 CONTINUE
00033          IERR = 1
00034          RETURN
00035          END
```

```
00001          SUBROUTINE NFIELD(INBUF,IS,IE,ITEMP,IERR)
00002     C
00003     C    AUTHOR
00004     C        BOB RINGO
00005     C        STANFORD RESEARCH INSTITUTE/NWRC
00006     C        MENLO PARK, CALIFORNIA
00007     C
00008     C    DATE OF LAST REVISION
00009     C        24 NOVEMBER 1976
00010     C
00011     C    PURPOSE
00012     C        TO TRANSFER A NUMERIC CHARACTER STRING FROM VECTOR *INBUF*
00013     C        STARTING AT *IS* AND ENDING AT *IE* TO *ITEMP*. RIGHT BLANKS
00014     C        ARE STRIPPED OFF. ITEMP IS LEFT FILLED WITH BLANKS, AND EACH
00015     C        CHAR IS CHECKED FOR 0-9,(.),( ).  CHECK IS ALSO MADE FOR
00016     C        MORE THAN ONE (.).
00017     C
00018     C    DESCRIPTION OF VARIABLES
00019     C        IBLANK-BLANK FILLED WORD
00020     C        ICHAR -CHAR OF *INBUF* TO BE EXAMINED AND TRANSFERRED
00021     C        IE    -ENDING CHARACTER TO BE TRANSFERRED IN VECTOR *INBUF*
00022     C        IERR  -ERROR TAG--(0) FIELD IS OK, (1) BAD DATA IN NUMERIC FIE
00023     C        INBUF -INPUT VECTOR CONTAINING CHARACTER STRING TO BE TRANSFER
00024     C               AND EXAMINED FOR LEGITIMATE NUMERALS
00025     C        IRBLNK-TAG INDICATING--(0) RIGHT BLANKS IN CHAR STRING TO BE
00026     C               TRANSFERRED, (1) FIRST NON-BLANK CHAR HAS BEEN ENCOUNTE
00027     C        IS    -STARTING CHARACTER TO BE TRANSFERRED IN VECTOR *INBUF*
00028     C        ISC   -STARTING CHAR OF *ITEMP* TO RECEIVE CHARS FROM *INBUF*
00029     C        ITEMP -TARGET WORD FOR NUMERIC CHARACTER STRING TRANSFERRED
00030     C               FROM *INBUF*, LEFT FILLED WITH BLANKS
00031     C
00032          DOUBLE PRECISION INBUF,IBLANK,ITEMP
00033          DIMENSION INBUF(1)
00034          DATA IPRD /1H./
00035          DATA IBLNK/1H /
00036          DATA IBLANK/6H      /
00037     C
00038          ITEMP = IBLANK
00039          IERR=0
00040          NPRD = 0
00041          IRBLNK = 0
00042          ISC = IE - IS + 1
00043          J=IS+1
00044          DO 100 I=IS,IE
00045          J=J-1
00046          CALL GETCHA(ICHAR,INBUF(1),J)
00047          IF(ICHAR.EQ.IPRD) NPRD = NPRD + 1
00048          IF(ICHAR.EQ.IBLNK.AND.IRBLNK.EQ.0) GO TO 100
00049          CALL NUMCHK(ICHAR,JERR)
00050          IF(JERR.EQ.1) IERR=1
00051          CALL PUTCHA(ICHAR,ITEMP,ISC)
00052          IRBLNK = 1
00053          ISC = ISC -1
00054      100 CONTINUE
00055          IF(NPRD.GT.1) IERR = 1
00056          RETURN
               END
```

```
00001          SUBROUTINE AFIELD(INBUF,IS,IE,ITEMP,IERR)
00002     C
00003     C    AUTHOR
00004     C        BOB RINGO
00005     C        STANFORD RESEARCH INSTITUTE/NWRC
00006     C        MENLO PARK, CALIFORNIA
00007     C
00008     C    DATE OF LAST REVISION
00009     C        24 NOVEMBER 1976
00010     C
00011     C    PURPOSE
00012     C        TO TRANSFER AND LEFT JUSTIFY A CHARACTER STRING FROM A VECTOR
00013     C        *INBUF* STARTING AT CHARACTER POSTION *IS* AND ENDING AT
00014     C        CHARACTER POSITION *IE* INTO *ITEMP*. LEADING BLANKS ARE
00015     C        STRIPPED OFF AND TRAILING CHARACTERS ARE BLANK FILLED.
00016     C
00017     C    DESCRIPTION OF VARIABLES
00018     C        I      -CURRENT CHARACTER POSITION OF *INBUF*
00019     C        IBLANK-BLANK FILLED WORD
00020     C        ICHAR -RIGHT JUSTIFIED, ZERO FILLED CHARACTER
00021     C        IERR  -ERROR TAG--(0) NO ERROR, (1) ERROR
00022     C        IFIRST-TAG INDICATING FIRST NON-BLANK CHARACTER HAS BEEN ENCOU
00023     C        INBUF -INPUT CHARACTER STRING VECTOR
00024     C        ITEMP -OUTPUT CHARACTER STRING--LEFT JUSTIFIED, BLANK FILLED
00025     C        K      -CHARACTER POSITION OF *ITEMP*
00026     C
00027     C    FUNCTIONS OR SUBROUTINES REQUIRED
00028     C        GETCHA
00029     C        PUTCHA
00030     C
00031     C-------------------------------------------------------------------------
00032     C
00033          DOUBLE PRECISION INBUF,ITEMP,IBLANK
00034          DIMENSION INBUF(1)
00035          DATA IBLANK/6H      /
00036          DATA IBLNK/1H /
00037     C
00038          ITEMP = IBLANK
00039          IERR = 0
00040          IFIRST = 0
00041          K = 0
00042     C
00043          DO 100 I=IS,IE
00044          CALL GETCHA(ICHAR,INBUF(1),I)
%FTNDIM LINE:00044 POSSIBLE DO INDEX MODIFICATION INSIDE LOOP
00045          IF(ICHAR.EQ.IBLNK.AND.IFIRST.EQ.0) GO TO 100
00046          IFIRST = 1
00047          K = K + 1
00048          CALL PUTCHA(ICHAR,ITEMP,K)
00049        100 CONTINUE
00050          RETURN
00051          END
```

```
00001          SUBROUTINE SCRNO(IT,ITEMP)
00002    C
00003    C     THIS ROUTINE OUTPUTS TO THE SCREEN, FORMAT AND DATA FOR A TABLE
00004    C
00005             INTEGER FORM, UFLD, FORMNO, OTSTR, FCHAR, GETCHR, OUTPTR,
00006           1 COLN, USRPTR, TRMTYP, UPC, DOWNC, LEFTC, RIGHTC, TRANSC,
00007           2 HOMEC, TABC, CRC, ERASEC, PROC, UNPROC, BLC, UNBLC,
00008           3 CPXPTR, CFLD, UROW, XCHAR, RFLD, DFLD, DDAY, BLANK,
00009           4 RUNPTR, DAYPTR
00010
00011             DOUBLE PRECISION ITEMP,NULL,IUTYPE,IETYPE,IUSUB,
00012           1 ICMPLX,MISS,IESUB,KTEMP
00013             DIMENSION ITEMP(19,17), KTEMP(20)
00014             DIMENSION  OTSTR(500)
00015             COMMON/MODS/IDRUN,IDAY
00016             DOUBLE PRECISION IDRUN
00017             COMMON /INBUFF/ INPTR,INBUF(200)
00018             DOUBLE PRECISION INBUF
00019             COMMON/TIO/TRMTYP,UPC,DOWNC,LEFTC,RIGHTC,UDX,TRANSC,
00020           1    HOMEC,TABC,ADSBP
00021            COMMON /SPECS/ ITABFR, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00022           1               IBLNK(15,17), IFORMT(2,19)
00023             COMMON /CURTAB/ FORMNO, FORM(24,80)
00024             COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00025           1 IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00026             DATA UFLD/"7250040201 00/
00027             DATA CFLD/"6150040201 00/
00028             DATA RFLD/"7110040201 00/
00029             DATA DFLD/"6210040201 00/
00030    C
00031    C-------CLEAR SCREEN
00032             CALL NWSCRN(0)
00033    C
00034    C-------READ-IN TABLE FROM FORMS FILE
00035             IF(IT.LT.15 .AND. IT.EQ.FORMNO) GO TO 20
00036             DO 10 IROW = 1,24
00037             INX = IROW+24*(IT-1)
00038             READ(23#INX,1000) (FORM(IROW,ICOL),ICOL=1,80)
00039    10       CONTINUE
00040             FORMNO=IT
00041    C
00042    C-------REPLACE "u" WITH DATA CHAR COUNT
00043             CALL FORMS(UFLD)
00044    C
00045    C------GET COMPLEX HEADERS FOR TABLE 13
00046             IF(IT .NE. 13) GO TO 17
00047             DO 16 I=1,8
00048             KTEMP(I)=ICMPLX(1,I)
00049             KTEMP(I+8)=ICMPLX(2,I)
00050    16       CONTINUE
00051    17       CONTINUE
00052    C
00053    C------ENCODE BATTLE DAYS FOR OUTPUT TABLES
00054             IF(IT .GT. 14) ENCODE(2,1001,DDAY) IDAY
00055    C
00056    C-------INITIALIZE POINTERS
```

```
00057   20      CONTINUE
00058           IROW=0
00059           NFLD=0
00060           NCFLD=0
00061           OUTPTR=0
00062           INBPTR=0
00063   C
00064   C-------BEGIN NEW ROW
00065   30      CONTINUE
00066           IROW=IROW+1
00067           IF(IROW .GT. 24) GO TO 200
00068           ICOL=0
00069           USRPTR=0
00070           CPXPTR=0
00071           RUNPTR=0
00072           DAYPTR=0
00073           JBLNK=0
00074           NFLD=0
00075   C
00076   C-------NEXT COLUMN
00077   40      CONTINUE
00078           ICOL=ICOL+1
00079           IF(ICOL .GT. 80) GO TO 30
00080           OUTPTR=OUTPTR+1
00081           FCHAR=FORM(IROW,ICOL)
00082           IF(GETCHR(FCHAR,1) .EQ. 0) GO TO 50
00083           IF(FCHAR .EQ. CFLD) GO TO 70
00084           IF(FCHAR .EQ. RFLD) GO TO 80
00085           IF(FCHAR .EQ. DFLD) GO TO 90
00086   C
00087   C-------OUTPUT A FORMS CHARACTER
00088           CPXPTR=0
00089           USRPTR=0
00090           RUNPTR=0
00091           DAYPTR=0
00092           IF(JBLNK .EQ. 0) GO TO 45
00093           JBLNK=0
00094           CALL PTUBLC(OTSTR,OUTPTR)
00095   45      CONTINUE
00096           IF(FCHAR .EQ. -1) GO TO 100
00097           CALL PUTCHA(FCHAR, OTSTR, OUTPTR)
00098           GO TO 40
00099   C
00100   C-------BEGIN A USER DATA FIELD "u"
00101   50      CONTINUE
00102           RUNPTR=0
00103           DAYPTR=0
00104           CPXPTR=0
00105           IF(USRPTR .NE. 0) GO TO 60
00106           NFLD = NFLD+1
00107           UROW = IROW-ITABFR
00108           IF(IBLNK(NFLD,UROW) .EQ. 0) GO TO 60
00109           CALL PUTCHR(LEFTC,OTSTR,OUTPTR)
00110           OUTPTR=OUTPTR+1
00111           CALL PUTCHR(62,OTSTR,OUTPTR)
00112           OUTPTR=OUTPTR+1
```

```
00113           CALL PTBLC(OTSTR,OUTPTR)
00114           JBLNK=1
00115   60      CONTINUE
00116           USRPTR=USRPTR+1
00117           CALL GETCHA(UCHAR, ITEMP(NFLD,UROW), USRPTR)
00118           CALL PUTCHA(UCHAR, OTSTR, OUTPTR)
00119           INBPTR = INBPTR+1
00120           CALL PUTCHA(UCHAR,INBUF,INBPTR)
00121           GO TO 40
00122   C
00123   C------PROCESS A COMPLEX HEADER FIELD "c"
00124   70      CONTINUE
00125           RUNPTR=0
00126           DAYPTR=0
00127           USRPTR=0
00128           IF(CPXPTR .EQ. 0) NCFLD=NCFLD+1
00129           CPXPTR=CPXPTR+1
00130           CALL GETCHA(XCHAR, KTEMP(NCFLD), CPXPTR)
00131           CALL PUTCHA(XCHAR, OTSTR, OUTPTR)
00132           GO TO 40
00133   C
00134   C------PROCESS A RUNID FIELD "r"
00135   80      CONTINUE
00136           CPXPTR=0
00137           USRPTR=0
00138           DAYPTR=0
00139           RUNPTR=RUNPTR+1
00140           XCHAR=BLANK
00141           IF(RUNPTR .LE. 10) CALL GETCHA(XCHAR,IDRUN,RUNPTR)
00142           CALL PUTCHA(XCHAR,OTSTR,OUTPTR)
00143           GO TO 40
00144   C
00145   C------PROCESS A BATTLE DAYS FIELD "d"
00146   90      CONTINUE
00147           CPXPTR=0
00148           USRPTR=0
00149           RUNPTR=0
00150           DAYPTR=DAYPTR+1
00151           XCHAR=BLANK
00152           IF(DAYPTR .LE. 2) CALL GETCHA(XCHAR,IDAY,DAYPTR)
00153           CALL PUTCHA(XCHAR,OTSTR,OUTPTR)
00154           GO TO 40
00155   C
00156   C-------END OF LINE ENCOUNTERED
00157   100     CONTINUE
00158           CALL PUTCHR(13,OTSTR,OUTPTR)
00159           ICOL = 80
00160           IF(IROW .EQ. 24) GO TO 40
00161           OUTPTR = OUTPTR+1
00162           CALL PUTCHR(10,OTSTR,OUTPTR)
00163           GO TO 40
00164   C
00165   C-------
00166   200     CONTINUE
00167           CALL PTUBLC(OTSTR,OUTPTR)
00168           CALL PUTCHR(0, OTSTR, OUTPTR)
```

```
00169            CALL OUTSTR(DUM,OTSTR)
00170            RETURN
00171    C
00172    C-------FORMATS
00173    1000    FORMAT(80A1)
00174    1001    FORMAT(I2)
00175            END
```

```
00001          SUBROUTINE SCRNI(IT,ITEMP)
00002    C
00003    C     THIS ROUTINE READS UNPROTECTED DATA FROM THE SCREEN
00004    C
00005          DOUBLE PRECISION ITEMP,INBUF
00006          DIMENSION ITEMP(19,17)
00007            COMMON /INBUFF/ INBPTR,INBUF(200)
00008    C
00009    C-------CHECK FOR DUMMY READ
00010            IF(IT .NE. 0) GO TO 20
00011            CALL BUFIN(IT,INBUF,MODS)
00012            GO TO 200
00013    C
00014    C-------PROCESS REGULAR TABLE INPUT REQUEST
00015    20      CONTINUE
00016            CALL BUFIN(IT,INBUF,MODS)
00017    C
00018    C-------CHECK FOR ANY CHANGES MADE TO TABLE
00019            IF(MODS .GT. 0) GO TO 100
00020            IT=0
00021            GO TO 200
00022    C
00023    C-------CHANGE HAS BEEN MADE
00024    100     CONTINUE
00025            CALL GETLR(INBUF,IT,ITEMP,IERR)
00026            IF(IERR .EQ. 1) IT=-IT
00027    C
00028    C-------RETURN TO CALLER
00029    200     CONTINUE
00030            RETURN
00031            END
```

```
00001            SUBROUTINE RUFIN(TABLE,OUTARA,MODS)
00002    C
00003    C       THIS SUBROUTINE INPUTS CHARS TO PERFORM TABLE MODIFICATION
00004    C
00005            IMPLICIT INTEGER(A-Z)
00006          COMMON /SPECS/ ITABFR, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00007         1                IPLNK(15,17), IFORMT(2,19)
00008            COMMON/TIO/TRMTYP,UPC,DOWNC,LEFTC,RIGHTC,UDX,TRANSC,
00009         1     HOMEC,TABC,ADSBP
00010            COMMON/CURTAB/FORMNO,FORM(24,80)
00011    C
00012            DIMENSION OUTARA(1)
00013
00014            CRC=13
00015            ROWS=ITABLR+1
00016            MODS=0
00017    C
00018    C
00019    C
00020    C------SET TERMINAL IN BINARY MODE FOR CHAR MAPING
00021            CALL PTERM
00022    C
00023    C------CHECK FOR FOR DUMMY READ REQUEST
00024            IF(TABLE.NE.0) GO TO 100
00025    C
00026    C------GETTING CHARACTERS FROM TERMINAL
00027    20      CONTINUE
00028            CALL GETT(INCHAR)
00029    C
00030    C
00031            IF(TABLE .EQ. 0) GO TO 150
00032            IF(INCHAR.EQ.CRC) GO TO 40
00033            IF(INCHAR.EQ.LEFTC) GO TO 50
00034            IF(INCHAR.EQ.RIGHTC) GO TO 60
00035            IF(INCHAR.EQ.UPC) GO TO 70
00036            IF(INCHAR.EQ.DOWNC) GO TO 80
00037            IF(INCHAR.EQ.TABC) GO TO 90
00038            IF(INCHAR.EQ.HOMEC) GO TO 100
00039            IF(INCHAR.EQ.TRANSC) GO TO 110
00040    C
00041    C------NORMAL CHARACTER PROCESSING
00042    30      CONTINUE
00043            IF(INCHAR.LT.32 .OR. INCHAR.GT.126) GO TO 20
00044            MODS=MODS+1
00045            CALL SEND(INCHAR)
00046            X = FORM(ROW,POS)
00047            CALL PUTCHR(INCHAR,OUTARA,X)
00048            POS = POS+1
00049            IF(POS.LT.80 .AND. GETCHR(FORM(ROW,POS),1).EQ.0) GO TO 20
00050            CALL SEND(LEFTC)
00051            POS = POS-1
00052            GO TO 20
00053    C
00054    C------CARRAGE RETURN PROCESSING
00055    40      CONTINUE
00056            CALL SEND(CRC)
```

```
00057           IF(TRMTYP.EQ.2) CALL SEND(DOWNC)
00058           POS = 1
00059           ROW=ROW+1
00060           IF(ROW .GT. ROWS) GO TO 100
00061           IF(GETCHR(FORM(ROW,POS),1) .EQ. 0) GO TO 20
00062           GO TO 60
00063   C
00064   C------LEFT CURSOR PROCESSING
00065   50      CONTINUE
00066           IP = POS-1
00067           IF(IP.LT.1) GO TO 60
00068           CALL SEND(LEFTC)
00069           POS = POS-1
00070           IF(GETCHR(FORM(ROW,POS),1) .EQ. 0) GO TO 20
00071           GO TO 50
00072   C
00073   C------RIGHT CURSOR PROCESSING
00074   60      CONTINUE
00075           IP = POS+1
00076           IF(IP.GT.80) GO TO 40
00077           CALL SEND(RIGHTC)
00078           POS = POS+1
00079           IF(GETCHR(FORM(ROW,POS),1) .EQ. 0) GO TO 20
00080           GO TO 60
00081   C
00082   C------UP CURSOR PROCESSING
00083   70      CONTINUE
00084           IR = ROW-ITABER-1
00085           IF(IR.LT.1) GO TO 20
00086           CALL SEND(UPC)
00087           ROW = ROW-1
00088           IF(GETCHR(FORM(ROW,POS),1) .EQ. 0) GO TO 20
00089           GO TO 70
00090   C
00091   C------DOWN CURSOR PROCESSING
00092   80      CONTINUE
00093           IR = ROW+1
00094           IF(IR.GT.ROWS) GO TO 20
00095           CALL SEND(DOWNC)
00096           ROW = ROW+1
00097           IF(GETCHR(FORM(ROW,POS),1) .EQ. 0) GO TO 20
00098           GO TO 80
00099   C
00100   C------TAB CURSOR PROCESSING
00101   C       SCAN TO END OF CURRENT FIELD
00102   90      CONTINUE
00103           IF(POS.GE.80) GO TO 95
00104           CALL SEND(RIGHTC)
00105           POS = POS+1
00106           IF(GETCHR(FORM(ROW,POS),1) .EQ. 0) GO TO 90
00107   C------SCAN TO BEG OF NEXT FIELD
00108           GO TO 60
00109   C------END OF CURRENT LINE HIT WHILE TABING
00110   95      CONTINUE
00111           IF(ROW.GE.ROWS) GO TO 100
00112           GO TO 40
```

```
00113   C
00114   C------HOME CURSOR PROCESSING
00115   100     CONTINUE
00116           CALL SEND(HOMEC)
00117           ROW = 1
00118           POS = 1
00119           IR = ITABER
00120           IF(IR.EQ.0) GO TO 105
00121           DO 104 I=1,IR
00122           CALL SEND(DOWNC)
00123           ROW = ROW+1
00124   104     CONTINUE
00125   105     CONTINUE
00126           IF(GETCHR(FORM(ROW,POS),1) .EQ. 0) GO TO 70
00127           GO TO 60
00128   C
00129   C------XMIT DATA PROCESSNG
00130   110     CONTINUE
00131           GO TO 150
00132   C
00133   C------EXIT PROCESSING
00134   150     CONTINUE
00135           CALL STERM
00136           CALL ANSCRN(0)
00137           RETURN
00138           END
```

```
00001            SUBROUTINE RDYOUT(IT, ITEMP)
00002    C
00003    C       THIS SUBROUTINE PREPARES OUTPUT TABLE DATA FOR DISPLAY
00004    C
00005            DOUBLE PRECISION ITEMP(19,17),NULL
00006            DOUBLE PRECISION IUTYPE,IETYPE,IUSUB,IESUB,ICMPLX,MISS,
00007           1 DCOMPS,DPLEX,ORIG,TARG,TTS
00008            REAL LRDEF, LIVPLX
00009            INTEGER ORIGIN,TARGET,START,STOP,UMAX,UMIN,UREADY,UASK,
00010           1 UGOT
00011    C
00012    C
00013            COMMON/MODS/IDRUN,IDAY
00014            DOUBLE PRECISION IDRUN
00015            COMMON/BLOCKB/DSUNIT(2,20,2),SCOMPS(2,20,5),COMPS(2,20,5),
00016           1 STRAT(2,20,4),ADEPAT(2,20,2),AGKILL(2,20,10),SRATE(2,2,5),
00017           2 DCOMPS(2,10),MAXP(2,20),LRDEF(2,20),WSTWX(2,20),BWDEF(2,20),
00018           3 DRMAX(2,20),SPEED(2,20),IRRTIM(2,5),SR30MX(2,5),IMAXR(2,20),
00019           4 ILRDEF(2,20),IWSTWX(2,20),IBWDEF(2,20),NCOMPS(2),NSUNIT(2)
00020            COMMON/BLOCKC/COMPLX(2,10,10),DPLEX(2,10),DTSLI(2,10),
00021           1 SURFAC(2,10),DEFAC(2,10),ICYCLE(2,10),IREPL(2,10),
00022           2 REPUPS(2,10,2),OPS(2,11),REPAIR(2,11),NPLEX(2),MTIME(2),
00023           3 NDAYS,JWXDEF,JLRDEF,WXSURV,DELAY,OPSLCH,OPSLND
00024            COMMON/BLOCKD/IONOFF(2,20,2),JONOFF(2,20,2),S1(2,20,2),
00025           1 S2(2,20,2),MTS(2,20,8),UNIT(2,20,2),SA(2,20,2),SB(2,20,2),
00026           2 TTS(2,20),RANGE(10,10),IRANGE(10,10),DMISS(2,20),IPRI(2,20),
00027           3 ORIG(2,20),TARG(2,20),UMAX(2,20),UMIN(2,20),ORIGIN(2,20),
00028           4 TARGET(2,20),IUNIT(2,20),START(2,20),STOP(2,20),UREADY(2,20),
00029           5 DAY(30),WX(30),IWX(30),NMISS(2)
00030            COMMON/BLOCKE/LIVPLX(2,10,10),UASK(2,20,3),UGOT(2,20,3),
00031           1 SR30(2,10,5),AIRUP(20,5,8),AIRDN(20,5,8),ADBASE(2,10)
00032            COMMON/IFACE/IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00033           1 IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00034             COMMON /SPECS/ ITABER, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00035           1                IBLNK(15,17), IFORMT(2,19)
00036            COMMON/MAX/MAXCMP,MAXUNT,MAXMIS,NIT,MAXFLD,MAXROW,NULL
00037             COMMON /AIREXP/ EXPS(19,10)
00038               DIMENSION IEXPS(19,10)
00039    C
00040    C------INITIALIZE ALL FIELDS TO BLANKS
00041            DO 20 I=1,19
00042            DO 20 J=1,MAXROW
00043            ITEMP(I,J) = NULL
00044    20      CONTINUE
00045    C
00046    C------
00047            IF(IT .EQ. 19) GO TO 80
00048            IREQ = 0
00049            IF(IT.EQ.16 .OR. IT.EQ.18) IREQ=1
00050            L = IREQ+1
00051            IF(IT .GT. 16) GO TO 70
00052            NM = NMISS(L)
00053            DO 55 M=1,NM
00054            IT1 = UASK(L,M,1)+UASK(L,M,2)+UASK(L,M,3)
00055            IT2 = UGOT(L,M,1)+UGOT(L,M,2)+UGOT(L,M,3)
00056            ENCODE(120,1000,ITEMP(1,M)) DMISS(L,M),IPRI(L,M),
```

```
00057         1  ORIG(L,M),TARG(L,M),SA(L,M,1),SB(L,M,1),SA(L,M,2),
00058         2  SB(L,M,2),TTS(L,M),UNIT(L,M,1),UNIT(L,M,2),UMAX(L,M),
00059         3  IT1,IT2
00060    55       CONTINUE
00061             GO TO 100
00062    C
00063    C------
00064    70       CONTINUE
00065             NC = NCOMPS(L)
00066             NP = NPLEX(L)
00067             NCHAR = 70
00068             IF(IT .EQ. 18) NCHAR=90
00069             NM = 0
00070             DO 75 K=1,NP
00071             NM = NM+1
00072             ENCODE(NCHAR,1001,ITEMP(1,NM)) DPLEX(L,K),
00073         1   (LIVPLX(L,K,I),I=1,NC)
00074             NM = NM+1
00075             ENCODE(NCHAR,1002,ITEMP(1,NM)) (COMPLX(L,K,I),I=1,NC)
00076    75       CONTINUE
00077             GO TO 100
00078    C
00079    C------
00080    80       CONTINUE
00081             DO 84 I=1,IDAY
00082             IEXPS(1,I)=I
00083             DO 84 J=2,19
00084             IEXPS(J,I)=EXPS(J,I)
00085    84       CONTINUE
00086             IF(IDAY.LE.9) IEXPS(1,IDAY+1)=0
00087    C
00088    C------FORMING TABLE 19 INTO ITEMP
00089             MDY=0
00090             IROW=0
00091    90       CONTINUE
00092             MDY=MDY+1
00093             IF(IEXPS(1,MDY).EQ.0 .OR. MDY.GT.10) GO TO 95
00094             IROW=IROW+1
00095             ENCODE(100,1003,ITEMP(1,IROW))(IEXPS(I,MDY),I=1,10)
00096             ENCODE(90,1004,ITEMP(11,IROW))(IEXPS(I,MDY),I=11,19)
00097             GO TO 90
00098    95       CONTINUE
00099    C
00100    C-------RETURN TO CALLER
00101    100      CONTINUE
00102             RETURN
00103    C
00104    C------FORMATS
00105    1000     FORMAT(A5,5X,I1,9X,A6,4X,A6,4X,A3,A5,2X,A3,A5,2X,A8,2X,
00106         1   A5,5X,A3,7X,I3,7X,I3,7X,I3,7X)
00107    1001     FORMAT(A6,4X,4(F6.0,4X),4(F6.1,4X))
00108    1002     FORMAT(10X,4(F6.0,4X),4(F6.1,4X))
00109    1003     FORMAT(I2,8X,I4,6X,3(I3,7X),I4,6X,3(I3,7X),I4,6X)
00110    1004     FORMAT(3(I3,7X),I4,6X,5(I3,7X))
00111             END
```

```
00001            SUBROUTINE PTUBLC(OTSTR,OUTPTR)
00002    C       THIS SUBROUTINE PUTS THE APPROPRIATE CONTROL CHARACTERS INTO THE
00003    C       OUTPUT STRING 'OTSTR' TO TURN ON BLINKING.
00004            IMPLICIT INTEGER (A-Z)
00005            INTEGER OTSTR(1)
00006            COMMON/TIO/TRMTYP,UPC,DOWNC,LEFTC,RIGHTC,UDX,TRANSC,
00007          1         HOMEC,TABC,ADSPP
00008            IF(TRMTYP.EQ.1) GO TO 100
00009            IF(TRMTYP.EQ.3) GO TO 300
00010            IF(TRMTYP.EQ.2) GO TO 200
00011            TYPE 9999,TRMTYP
00012    9999    FORMAT('   PTUBLC DOES NOT SUPPORT TERMINAL TYPE ',I6)
00013            RETURN
00014    100     CALL PUTCHR(24,OTSTR,OUTPTR)
00015            OUTPTR = OUTPTR + 1
00016            RETURN
00017    300     CALL PUTCHR(15,OTSTR,OUTPTR)
00018            OUTPTR = OUTPTR + 1
00019            RETURN
00020    200     CALL PUTCHR(127,OTSTR,OUTPTR)
00021            OUTPTR = OUTPTR + 1
00022            RETURN
00023            END
```

```
00001            SUBROUTINE PTBLC(OTSTR,OUTPTR)
00002    C       THIS SUBROUTINE PUTS THE APPROPRIATE CONTROL CHARACTERS INTO THE
00003    C       OUTPUT STRING 'OTSTR' TO TURN OFF BLINKING.
00004            IMPLICIT INTEGER (A-Z)
00005            INTEGER OTSTR(1)
00006            COMMON/TIO/TRMTYP,UPC,DOWNC,LEFTC,RIGHTC,UDX,TRANSC,
00007           1        POMEC,TABC,ADSBP
00008            IF(TRMTYP.EQ.1) GO TO 100
00009            IF(TRMTYP.EQ.3) GO TO 300
00010            IF(TRMTYP.EQ.2) GO TO 200
00011            TYPE 9999,TRMTYP
00012    9999    FORMAT('   PTUBLC DOES NOT SUPPORT TERMINAL TYPE ',I6)
00013            RETURN
00014    100     CALL PUTCHR(14,OTSTR,OUTPTR)
00015            OUTPTR = OUTPTR + 1
00016            RETURN
00017    300     CALL PUTCHR(31,OTSTR,OUTPTR)
00018            OUTPTR = OUTPTR + 1
00019            CALL PUTCHR(14,OTSTR,OUTPTR)
00020            OUTPTR = OUTPTR + 1
00021            RETURN
00022    200     CALL PUTCHR(127,OTSTR,OUTPTR)
00023            OUTPTR = OUTPTR + 1
00024            RETURN
00025            END
```

```
00001            SUBROUTINE INIT
00002    C
00003    C       THIS SUBROUTINE OBTAINS THE TERMINAL TYPE NUMBER FROM THE
00004    C       USER AND SETS THE VALUES OF APPROPRIATE CHARACTERS.
00005    C
00006            IMPLICIT INTEGER (A-Z)
00007            COMMON/TIO/TRMTYP,UPC,DOWNC,LEFTC,RIGHTC,UDX,TRANSC,
00008         1     HOMEC,TABC,ADSBP
00009    C
00010    C------ASK USER FOR TERMINAL TYPE
00011    20      CONTINUE
00012            TYPE 1001
00013            TYPE 1000
00014            CALL GETINT(TRMTYP)
00015    C
00016    C------CHECK FOR VALID TYPES
00017            IF(TRMTYP .EQ. 1) GO TO 50
00018            IF(TRMTYP .EQ. 2) GO TO 60
00019            GO TO 20
00020    C
00021    C------SETUP CHAR DEFINATION FOR TABLE TOP DATAMEDIA 2500
00022    50      CONTINUE
00023            CALL STERM
00024            UPC = 26
00025            DOWNC = 10
00026            LEFTC = 3
00027            RIGHTC = 28
00028            TRANSC = 17
00029            HOMEC = 2
00030            TABC = 9
00031            CRC = 13
00032            ERASEC = 30
00033            PROC = 127
00034            UNPROC = 127
00035            BLC = 14
00036            UNBLC = 24
00037            GO TO 200
00038    C
00039    C-------SETUP CHAR DEFINATIONS FOR PORTABLE DATAMEDIA 1520
00040    60      CONTINUE
00041            CALL STERM
00042            UPC = 31
00043            DOWNC = 10
00044            LEFTC = 8
00045            RIGHTC = 29
00046            TRANSC = 17
00047            HOMEC = 25
00048            TABC = 9
00049            CRC = 13
00050            ERASEC = 12
00051            PROC = 127
00052            UNPROC = 127
00053            BLC = 127
00054            UNBLC = 127
00055            GO TO 200
00056    C
```

```
00057   C------RETURN TO CALLER
00058   200      CONTINUE
00059            RETURN
00060   C
00061   C------FORMATS
00062   1000     FORMAT('  TERMINAL TYPE?')
00063   1001     FORMAT('  ACCEPTABLE TYPES ARE',//,
00064        1   '    1 = TABLE-TOP DATAMEDIA MODEL 2500.',//,
00065        2   '    2 = PORTABLE DATAMEDIA MODEL 1520.')
00066            END
```

```
00001            SUBROUTINE MOVC(Y,X)
00002    C
00003    C       THIS SUBROUTINE POSITIONS THE CURSOR ON THE TERMINAL VIA X,Y ADD
00004    C               Y=ROW NUMBER, FIRST ROW IS 1
00005    C               X=COL NUMBER, FIRST COL IS 1
00006    C
00007            IMPLICIT INTEGER (A-Z)
00008            COMMON/TIO/TRMTYP,UPC,DOWNC,LEFTC,RIGHTC,UDX,TRANSC,
00009           1    HOMEC,TABC,ADSBP
00010            IF(TRMTYP .EQ. 1) GO TO 100
00011            IF(TRMTYP .EQ. 2) GO TO 110
00012            GO TO 500
00013    C
00014    C
00015    100     CALL BTERM
00016            CALL SEND(12,UDX)
00017            J=X+96
00018            IF(X.GT.31) J=J-64
00019            IF(X.GT.63) J=J-64
00020            CALL SEND(J,UDX)
00021            J=Y+96
00022            CALL SEND(J,UDX)
00023            CALL STERM
00024            GO TO 500
00025    C
00026    C------
00027    110     CONTINUE
00028            CALL BTERM
00029            CALL SEND(30,UDX)
00030            J=X+31
00031            CALL SEND(J,UDX)
00032            J=Y-1
00033            CALL SEND(J,UDX)
00034            CALL STERM
00035            GO TO 500
00036    C
00037    C
00038    500     CONTINUE
00039            RETURN
00040            END
```

```
00001            SUBROUTINE NWSCRN(ACLR)
00002    C
00003    C       THIS SUBROUTINE CLEARS THE SCREEN AND HOMES THE CURSOR
00004    C
00005            IMPLICIT INTEGER (A-Z)
00006            COMMON/TIO/TRMTYP,UPC,DOWNC,LEFTC,RIGHTC,UDX,TRANSC,
00007         1     HOMEC,TABC,ADSBP
00008            CRC=13
00009            ERASEC=30
00010            IF(TRMTYP.EQ.2) ERASEC=12
00011    C
00012    C------CHECK FOR ERASABLE TERM TYPE
00013            IF(TRMTYP.EQ.1) GO TO 10
00014            IF(TRMTYP.EQ.2) GO TO 10
00015            GO TO 200
00016    C
00017    C------ERASE SCREEN
00018    10      CONTINUE
00019            CALL SEND(CRC,UDX)
00020            CALL BTERM
00021            CALL SEND(ERASEC,UDX)
00022            CALL SEND(29,UDX)
00023            CALL STERM
00024            GO TO 200
00025    C
00026    C------RETURN TO CALLER
00027    200     CONTINUE
00028            RETURN
00029            END
```

```
00001            SUBROUTINE FORMS(UFLD)
00002    C
00003    C       THIS SUBROUTINE SCANS A FORM REPLACING USER FIELD CHARACTERS
00004    C       WITH THE CHARACTER COUNT INDEX.  IT ALSO RECORDS DESCRIPTIVE
00005    C       DATA ABOUT THE FORM FOR OTHER ROUTINES.
00006    C
00007    C
00008            COMMON /CURTAB/ FORMNO, FORM(24,80)
00009            COMMON /SPECS/ ITABER, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00010         1                 IBLNK(15,17), IFORMT(2,19)
00011            INTEGER FORM, UFLD, BLANK, LNEND, FORMNO
00012            DATA BLANK,LNEND/1H ,-1/
00013    C
00014    C-------INITIALIZE VARIABLES
00015            ITABER = -1
00016            ITABLR = -1
00017            ITABNR = 0
00018            ITABNF = 0
00019            COLN = 0
00020            DO 10 I=1,15
00021            IFORMT(1,I) = 0
00022            IFORMT(2,I) = 0
00023    10      CONTINUE
00024            JFLD = 1
00025            IROW = 0
00026            ICOL = 0
00027    C
00028    C-------BEGIN SCAN OF NEXT ROW/LINE
00029    20      CONTINUE
00030            IROW = IROW+1
00031            IF(IROW .GT. 24) GO TO 100
00032            LCOLN = COLN
00033            ICOL = 0
00034            LEN = 0
00035            NCHAR = 0
00036    C
00037    C-------SCAN NEXT CHARACTER
00038    30      CONTINUE
00039            ICOL = ICOL+1
00040            IF(ICOL .GT. 80) GO TO 70
00041    C
00042    C-------PROCESS A USER FIELD CHARACTER
00043            IF(FORM(IROW,ICOL) .NE. UFLD) GO TO 50
00044            LEN = ICOL
00045            COLN = COLN+1
00046            FORM(IROW,ICOL) = COLN
00047            IF(ITABER .NE. -1) GO TO 30
00048            NCHAR = NCHAR+1
00049            IF(NCHAR .EQ. 1) IFORMT(1,JFLD) = ICOL-1
00050            GO TO 30
00051    C
00052    C-------PROCESS A NON-USER FIELD CHARACTER
00053    50      CONTINUE
00054            IF(FORM(IROW,ICOL) .NE. BLANK) LEN=ICOL
00055            IF(NCHAR .EQ. 0) GO TO 30
00056            IFORMT(2,JFLD) = NCHAR
```

```
00057           NCHAR = 0
00058           JFLD = JFLD+1
00059           GO TO 30
00060     C
00061     C-------END OF CHARACTER SCAN FOR THIS LINE
00062     70    CONTINUE
00063           IF(NCHAR .EQ. 0) GO TO 80
00064           IFORMT(2,JFLD) = NCHAR
00065           NCHAR = 0
00066           JFLD = JFLD+1
00067     80    CONTINUE
00068     C
00069     C-------MARK ACTUAL END OF LINE IF LESS THAN 80 CHARACTERS
00070           IF(LEN .LT. 80) FORM(IROW,LEN+1)=LNEND
00071     C
00072     C-------NOTE IF ANY USER FIELD CHARACCTERS WERE IN THIS LINE
00073           IF(COLN .EQ. LCOLN) GO TO 90
00074           IF(LCOLN .EQ. 0) ITABFR = IROW-1
00075           ITABNR = ITABNR+1
00076           ITABLR = IROW-1
00077     90    CONTINUE
00078     C
00079     C-------GO FOR NEXT LINE TO SCAN
00080           GO TO 20
00081     C
00082     C-------ALL LINES OF THIS FORM SCANNED, NOTE NUMB. OF USER FLDS.
00083     100   CONTINUE
00084           ITABNF = JFLD-1
00085           RETURN
00086           END
```

```
00001          SUBROUTINE LISTO(IT,ITEMP)
00002    C
00003    C        THIS ROUTINE OUTPUTS A TABLE TO THE LINE PRINTER
00004    C
00005             INTEGER FORM, UFLD, FORMNO, OTSTR, FCHAR, GETCHR, OUTPTR,
00006           1 COLN, USRPTR, TRMTYP, UPC, DOWNC, LEFTC, RIGHTC, TRANSC,
00007           2 HOMEC, TABC, CRC, ERASEC, PROC, UNPROC, BLC, UNBLC,
00008           3 CPXPTR, CFLD, UROW, XCHAR, RFLD, DFLD, DDAY, BLANK,
00009           4 RUNPTR, DAYPTR
00010    C
00011             DOUBLE PRECISION ITEMP,NULL,IUTYPE,IETYPE,IUSUB,
00012           1 ICMPLX,MISS,IESUB,KTEMP
00013             DIMENSION ITEMP(19,17), KTEMP(20)
00014             DIMENSION  OTSTR(16)
00015             COMMON/MODS/IDRUN,IDAY
00016             DOUBLE PRECISION IDRUN
00017           COMMON /SPECS/ ITABFR, ITABLR, ITABNR, ITABNF, IFLDS(14,15),
00018           1              IBLNK(15,17), IFORMT(2,19)
00019             COMMON /CURTAB/ FORMNO, FORM(24,80)
00020             COMMON /IFACE/ IUTYPE(2,15),IETYPE(2,15),IUSUB(2,15,15),
00021           1 IESUB(2,15,15),ICMPLX(2,8),MISS(2,17)
00022             DATA UFLD/"725004020100/
00023             DATA CFLD/"615004020100/
00024             DATA RFLD/"711004020100/
00025             DATA DFLD/"621004020100/
00026             DATA BLANK/1H /
00027    C
00028    C--------READ-IN TABLE FROM FORMS FILE
00029             IF(IT.LT.15 .AND. IT.EQ.FORMNO) GO TO 20
00030             DO 10 IROW = 1,24
00031             INX = IROW+24*(IT-1)
00032             READ(23#INX,1000) (FORM(IROW,ICOL),ICOL=1,80)
00033    10       CONTINUE
00034             FORMNO=IT
00035    C
00036    C--------REPLACE "u" WITH DATA CHAR COUNT
00037             CALL FORMS(UFLD)
00038    C
00039    C-------GET COMPLEX HEADERS FOR TABLE 13
00040             IF(IT .NE. 13) GO TO 17
00041             DO 16 I=1,8
00042             KTEMP(I)=ICMPLX(1,I)
00043             KTEMP(I+8)=ICMPLX(2,I)
00044    16       CONTINUE
00045    17       CONTINUE
00046    C
00047    C-------ENCODE BATTLE DAYS FOR OUTPUT TABLES
00048             IF(IT .GT. 14) ENCODE(2,1001,DDAY) IDAY
00049    C
00050    C--------INITIALIZE POINTERS
00051    20       CONTINUE
00052             IROW=0
00053             NFLD=0
00054             NCFLD=0
00055    C
00056    C--------BEGIN NEW ROW
```

```
00057   30      CONTINUE
00058           IROW=IROW+1
00059           IF(IROW .GT. 23) GO TO 200
00060           ICOL=0
00061           USRPTR=0
00062           CPXPTR=0
00063           RUNPTR=0
00064           DAYPTR=0
00065           DO 35 I=1,16
00066           OTSTR(I) = BLANK
00067   35      CONTINUE
00068           NFLD=0
00069   C
00070   C--------NEXT COLUMN
00071   40      CONTINUE
00072           ICOL=ICOL+1
00073           IF(ICOL .GT. 80) GO TO 100
00074           FCHAR=FORM(IROW,ICOL)
00075           IF(GETCHR(FCHAR,1) .EQ. 0) GO TO 50
00076           IF(FCHAR .EQ. CFLD) GO TO 70
00077           IF(FCHAR .EQ. RFLD) GO TO 80
00078           IF(FCHAR .EQ. DFLD) GO TO 90
00079           IF(FCHAR .EQ. -1) GO TO 100
00080   C
00081   C--------OUTPUT A FORMS CHARACTER
00082           CPXPTR=0
00083           USRPTR=0
00084           RUNPTR=0
00085           DAYPTR=0
00086           CALL PUTCHA(FCHAR, OTSTR, ICOL)
00087           GO TO 40
00088   C
00089   C--------BEGIN A USER DATA FIELD "u"
00090   50      CONTINUE
00091           RUNPTR=0
00092           DAYPTR=0
00093           CPXPTR=0
00094           IF(USRPTR .NE. 0) GO TO 60
00095           NFLD = NFLD+1
00096           UROW = IROW-ITABER
00097           IF(IBLNK(NFLD,UROW) .EQ. 0) GO TO 60
00098           CALL PUTCHR(62,OTSTR,ICOL-1)
00099   60      CONTINUE
00100           USRPTR=USRPTR+1
00101           CALL GETCHA(UCHAR, ITEMP(NFLD,UROW), USRPTR)
00102           CALL PUTCHA(UCHAR, OTSTR, ICOL)
00103           GO TO 40
00104   C
00105   C------PROCESS A COMPLEX HEADER FIELD "c"
00106   70      CONTINUE
00107           RUNPTR=0
00108           DAYPTR=0
00109           USRPTR=0
00110           IF(CPXPTR .EQ. 0) NCFLD=NCFLD+1
00111           CPXPTR=CPXPTR+1
00112           CALL GETCHA(XCHAR, ITEMP(NCFLD), CPXPTR)
```

```
00113           CALL PUTCHA(XCHAR, OTSTR, ICOL)
00114           GO TO 40
00115   C
00116   C------PROCESS A RUNID FIELD "r"
00117   80      CONTINUE
00118           CPXPTR=0
00119           USRPTR=0
00120           DAYPTR=0
00121           RUNPTR=RUNPTR+1
00122           XCHAR=BLANK
00123           IF(RUNPTR .LE. 10) CALL GETCHA(XCHAR,IDRUN,RUNPTR)
00124           CALL PUTCHA(XCHAR,OTSTR,ICOL)
00125           GO TO 40
00126   C
00127   C------PROCESS A BATTLE DAYS FIELD "d"
00128   90      CONTINUE
00129           CPXPTR=0
00130           USRPTR=0
00131           RUNPTR=0
00132           DAYPTR=DAYPTR+1
00133           XCHAR=BALNK
00134           IF(DAYPTR .LE. 2) CALL GETCHA(XCHAR,DDAY,DAYPTR)
00135           CALL PUTCHA(XCHAR,OTSTR,ICOL)
00136           GO TO 40
00137   C
00138   C-------END OF LINE ENCOUNTERED
00139   100     CONTINUE
00140           WRITE(3,1002) (OTSTR(I),I=1,16)
00141           GO TO 30
00142   C
00143   C-------ENTIRE TABLE LISTED, RETURN TO CALLER
00144   200     CONTINUE
00145           RETURN
00146   C
00147   C-------FORMATS
00148   1000    FORMAT(80A1)
00149   1001    FORMAT(I2)
00150   1002    FORMAT(1X,16A5)
00151           END
```

```
                                        TITLE   SLIB3 Fortran Library of usefull routines
                                        SUBTTL  GETCHA Getting a char from a char-string
                                ;
                                ; Calling Sequence:
                                ; CALL GETCHA (LCHAR, NWORD, NCHAR)
                                ; LCHAR=variable to receive the character (leftmost) that is gotten
                                ; NWORD=variable or array to bias NCHAR's from for source
                                ; NCHAR=integer, character position number relative to the
                                ;       leftmost character of NWORD.  The first character is 1,
                                ;       the second character is 2, etc.
                                ;
                                        ENTRY   GETCHA
000000' 47 45 64 43 60 41               SIXBIT  "GETCHA"
000001'                         GETCHA:
000001' 550 00 1 16 000002              HRRZ    0,@2(16)        ; get char position value
000002' 360 00 0 00 000000              SOJ     0,              ; correct position to zero base
000003' 231 00 0 00 000005              IDIVI   0,5             ; calc words & chars
000004' 201 02 0 16 000001              MOVEI   2,1(16)         ; get 2nd item in arg list
000005' 200 02 0 02 000000      IND:    MOVE    2,(2)
000006' 603 02 0 00 000020              TLNE    2,20            ; test for ind. bit on
000007' 324 00 0 00 000005'             JUMPA   IND
000010' 553 00 0 00 000002              HRRZS   2
000011' 270 00 0 00 000002              ADD     0,2             ; add word's to wd addr
000012' 500 00 0 01 000020'             HLL     0,PTAB(1)       ; get pntr bits from table
000013' 134 01 0 00 000000              ILDB    1,0             ; get char
000014' 242 01 0 00 000035              LSH     1,35            ; shift char to left of word
000015' 434 01 0 00 000025'             IOR     1,BMASK         ; blank out remaining chars
000016' 202 01 1 16 000000              MOVEM   1,@0(16)        ; put char in return word
000017' 263 17 0 00 000000              POPJ    17,             ; return to caller
                                ;
                                ;
000020'                         PTAB:
000020' 44 07 0 00 000000               POINT   7,0
000021' 35 07 0 00 000000               POINT   7,0,6
000022' 26 07 0 00 000000               POINT   7,0,13
000023' 17 07 0 00 000000               POINT   7,0,20
000024' 10 07 0 00 000000               POINT   7,0,27
000025'                         BMASK:
000025' 001004  020100                  OCT     1004020100
                                        PRGEND
```

```
                                        SUBTTL  PUTCHA Putting a char into a char-string
                                ;
                                ; Calling Sequence:
                                ; CALL PUTCHA (LCHAR, NWORD, NCHAR)
                                ; LCHAR=variable containing character(leftmost) to be put
                                ; NWORD=variable or array to bias NCHAR's from for dest.
                                ; NCHAR=integer, character position number relative to
                                ;       the leftmost character of NWORD.  The first
                                ;       character is 1, the second character is 2, etc.
                                ;
                                        ENTRY   PUTCHA
000000' 60 65 64 43 50 41               SIXBIT  'PUTCHA'
000001'                         PUTCHA:
000001' 550 00 1 16 000002              HRRZ    0,@2(16)        ; get char position value
000002' 360 00 0 00 000000              SOJ     0,              ; correct position to zero base
000003' 231 00 0 00 000005              IDIVI   0,5             ; calc position in wds & chars
000004' 201 02 0 16 000001              MOVEI   2,1(16)
000005' 200 02 0 02 000000      IND:    MOVE    2,(2)
000006' 603 02 0 00 000020              TLNE    2,20
000007' 324 00 0 00 000005'             JUMPA   IND
000010' 553 00 0 00 000002              HRRZS   2
000011' 270 00 0 00 000002              ADD     0,2             ; add wds to word address
000012' 500 00 0 01 000017'             HLL     0,PTAB(1)       ; get char pntr bits from table
000013' 200 01 1 16 000000              MOVE    1,@(16)         ; get char to be loaded (leftmost)
000014' 241 01 0 00 000007              ROT     1,7             ; shift char to rightmost
000015' 136 01 0 00 000000              IDPB    1,0             ; deposit char into string
000016' 263 17 0 00 000000              POPJ    17,             ; return to caller
                                ;
                                ;
000017'                         PTAB:
000017' 44 07 0 00 000000               POINT   7,0
000020' 38 07 0 00 000000               POINT   7,0,6
000021' 26 07 0 00 000000               POINT   7,0,13
000022' 17 07 0 00 000000               POINT   7,0,20
000023' 10 07 0 00 000000               POINT   7,0,27
                                        PROEND
```

```
                                        SUBTTL  OUTSTR Output a string to the controling terminal
                                        SEARCH  MONSYM          ; search system monitor library
                                ;
                                ; Calling Sequence:
                                ; CALL OUTSTR (DUMMY, ISTRNG)
                                ; DUMMY=unused argument
                                ; ISTRNG=variable or array containing the string to be output.
                                ;        The string is expected to begin with the leftmost character
                                ;        of ISTRNG and proceed to a zero byte.  The zero byte will
                                ;        not be output.
                                ;
                                        ENTRY   OUTSTR
000000' 57 65 54 63 64 62               SIXBIT  'OUTSTR'
000001'                         OUTSTR:
000001' 201 02 0 16 000001              MOVEI   2,1(16)
000002'                         IND:
000002' 200 02 0 02 000000              MOVE    2,(2)
000003' 603 02 0 00 000020              TLNE    2,20
000004' 324 00 0 00 000002'             JUMPA   IND
000005' 550 01 0 00 000002              HRRZ    1,2             ; string addr to pntr AC
000006' 500 01 0 00 000011'             HLL     1,[POINT 7,0]   ; pntr hdr to pntr AC
000007' 104 00 0 00 000076              PSOUT                   ; output string to zero byte
000010' 263 17 0 00 000000              POPJ    17,             ; return to caller
                                        PRGEND
```

```
                        SUBTTL  SEND Output a byte to the controling terminal
                        SEARCH  MONSYM          ; search system monitor library
                ;
                ; Calling Sequence:
                ; CALL SEND( CHAR, DUMMY)
                ; CHAR=character to output, right-justified
                ; DUMMY=unused argument
                ;
                        ENTRY   SEND
000000' 63 45 5e 44 00 00       SIXBIT  "SEND"
000001'                 SEND:
000001' 200 01 1 16 000000      MOVE    1,@0(16)        ; get word containing char right-just.
000002' 104 00 0 00 000074      PBOUT                   ; output one byte
000003' 263 17 0 00 000000      POPJ    17,             ; return to caller
                        PRGEND
```

```
                                        SUBTTL  SLP Pauses process for specified time
                                        SEARCH  MONSYM          ; search system monitor library
                                ;
                                ; Calling Sequence:
                                ; CALL SLP( MILSEC )
                                ; MILSEC=Integer, number of milliseconds to dismiss process
                                ;
                                        ENTRY   SLP
000000' 63 54 60 00 00 00               SIXBIT  'SLP'
000001'                         SLP:
000001' 200 01 1 16 000000              MOVE    1,@0(16)        ; get dismissal time period
000002' 104 00 0 00 000167              DISMS                   ; dismiss process
000003' 263 17 0 00 000000              POPJ    17,             ; return to caller
                                        PRGEND
```

```
                                        SUBTTL  GETT Get next byte from control terminal
                                        SEARCH  MONSYM          ; search system monitor library
                                ;
                                ; Calling Sequence:
                                ; CALL GETT (INCHAR)
                                ; INCHAR=contains the next byte from the controling terminal
                                ;        right justified zero filled
                                ;
                                        ENTRY   GETT
000000' 47 45 64 64 00 00               SIXBIT  'GETT'
000001'                         GETT:
000001' 104 00 0 00 000073              PBIN                    ; get nxt byte from term
000002' 405 01 0 00 000177              ANDI    1,177           ; mask off parity and garbage
000003' 202 01 1 16 000000              MOVEM   1,@0(16)        ; store in argument
000004' 263 17 0 00 000000              POPJ    17,             ; return to caller
                                        PRGEND
```

```
                                        SUBTTL  PUTCHR Putting rightmost data into byte stream
                                    ;
                                    ; Calling Sequence:
                                    ; CALL PUTCHR (IRCHAR, NWORD, NCHAR)
                                    ; IRCHAR=variable containg the data to be put rightmost 7 bits
                                    ; NWORD=variable or array to bias NCHAR's from for dest.
                                    ; NCHAR=Integer, character position number relative to
                                    ;       the leftmost character of NWORD.  The first
                                    ;       character is 1, the second character is 2, etc.
                                    ;
                                            ENTRY   PUTCHR
000000' 60 55 64 43 50 62                   SIXBIT  'PUTCHR'
000001'                             PUTCHR:
000001' 550 00 1 16 000002                  HRRZ    0,@2(16)        ; get char position value
000002' 360 00 0 00 000000                  SOJ     0,              ; correct position to zero base
000003' 231 00 0 00 000005                  IDIVI   0,5             ; calc position in wds & chars
000004' 201 02 0 16 000001                  MOVSI   2,1(16)
000005'                             IND:
000005' 200 02 0 02 000000                  MOVE    2,(2)
000006' 603 02 0 00 000020                  TLNE    2,20
000007' 324 00 0 00 000005'                 JUMPA   IND
000010' 553 00 0 00 000002                  HRRZS   2
000011' 270 00 0 00 000002                  ADD     0,2             ; add wds to word address
000012' 500 00 0 01 000016'                 HLL     0,PTAB(1)       ; get char pntr bits form table
000013' 200 01 1 16 000000                  MOVE    1,@(16)         ; get data to be loaded (rightmost)
000014' 136 01 0 00 000000                  IDPB    1,0             ; deposit char into string
000015' 263 17 0 00 000000                  POPJ    17,             ; return to caller
                                    ;
                                    ;
000016'                             PTAB:
000016' 44 07 0 00 000000                   POINT   7,0
000017' 35 07 0 00 000000                   POINT   7,0,6
000020' 26 07 0 00 000000                   POINT   7,0,13
000021' 17 07 0 00 000000                   POINT   7,0,20
000022' 10 07 0 00 000000                   POINT   7,0,27
                                            PRGEND
```

```
                                                SUBTTL  STERM Initializes term characteristics
                                                SEARCH  MONSYM          ; search system monitor library
                                                ENTRY   STERM
                                                SIXBIT  "STERM"
000000' 63 64 45 62 55 00
000001'                                 STERM:
000001' 200 01 0 00 000006'                     MOVE    1,[XWD 0,.PRIOU]
000002' 104 00 0 00 000107                      RFMOD
000003' 435 02 0 00 174300                      TRI     2,174300
000004' 104 00 0 00 000110                      SFMOD
000005' 263 17 0 00 000000                      POPJ    17,
                                                PRGEND
```

```
                                        SUBTTL  BTERM Puts terminal in binary mode
                                        SEARCH  MONSYM
                                        ENTRY   BTERM
                                        SIXBIT  /BTERM/
000000' 42 64 45 62 55 00       BTERM:
000001'
000001' 200 01 0 00 000007'             MOVE    1,[XWD 0,.PRIOU]
000002' 104 00 0 00 000107              RFMOD
000003' 404 02 0 00 000005'             AND     2,BMASK
000004' 104 00 0 00 000110              SFMOD
000005' 263 17 0 00 000000              POPJ    17,
000006' 777777  773477          BMASK:  XWD     777777,773477
                                        PRGEND
```

```
205                                             SUBTTL  GETCHR Getting a char(r-format) from a string
206                                     ;
207                                     ; Calling Sequence:
208                                     ; INTEGER FUNCTION ICHAR = GETCHR(LSTRING, NCHAR)
209                                     ; ICHAR=will contain the extracted char right-justified zero filled
210                                     ; LSTRING=variable or array containing the string
211                                     ; NCHAR=Integer, relative position of char in string
212                                     ;
213                                             ENTRY   GETCHR
214  000000' 47 45 54 43 50 62                  SIXBIT  'GETCHR'
215  000001'                            GETCHR:
216  000001' 550 00 1 16 000001                 HRRZ    0,@1(16)        ; get char position value
217  000002' 360 00 0 00 000000                 SOJ     0,              ; correct position to zero base
218  000003' 231 00 0 00 000005                 IDIVI   0,5             ; calc words & chars
219  000004' 202 02 0 00 000024'                MOVEM   2,SV2           ; save reg 2
220  000005' 201 02 0 16 000000                 MOVEI   2,(16)          ; get addr of fst item in arg list
221  000006'                            IND:
222  000006' 200 02 0 02 000000                 MOVE    2,(2)           ; replace addr with contents of addr
223  000007' 603 02 0 00 000020                 TLNE    2,20            ; test for ind. bit on, skip if off
224  000010' 324 00 0 00 000006'                JUMPA   IND
225  000011' 553 00 0 00 000002                 HRRZS   2               ; zero left half of addr word
226  000012' 270 00 0 00 000002                 ADD     0,2             ; add word's to wd addr
227  000013' 500 00 0 01 000017'                HLL     0,PTAR(1)       ; get pntr bits from table
228  000014' 134 00 0 00 000000                 ILDB    0,0             ; get char
229  000015' 200 02 0 00 000024'                MOVE    2,SV2           ; restore reg 2
230  000016' 262 17 0 00 000000                 POPJ    17,             ; return to caller
231                                     ;
232                                     ;
233  000017'                            PTAR:
234  000017' 44 07 0 00 000000                  POINT   7,0
235  000020' 35 07 0 00 000000                  POINT   7,0,6
236  000021' 26 07 0 00 000000                  POINT   7,0,13
237  000022' 17 07 0 00 000000                  POINT   7,0,20
238  000023' 10 07 0 00 000000                  POINT   7,0,27
239  000024' 000000  000000             SV2:    OCT     0
240                                             END
```

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